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By-Tuckman, Bruce

A Study of Curriculums for Occupational Preparation and Education. (Scope Program: Phase I) Progress Reports I and II.

Rutgers, The State Univ., New Brunswick, N.J.

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Identifiers-Study Of Curriculum For Occupational Preparation

The major objective of the Study of Curriculums for Occupational Preparation and Education (SCOPE) is to coordinate and contribute to national curriculum development effort at the secondary school level aimed at increasing the relevance of high school education for the large majority of our youth who must seek employment or further job training upon graduation. The first phase of the SCOPE program is Coordination of Occupational and Non-occupational Curriculums and Technology (CONECT). The objectives of this first phase are: (1) to establish communication among the state-supported vocational curriculum development centers, (2) to assist center directors in becoming aware of behavioral approaches to curriculum development, devices, and evaluation, (3) to refine and test a scheme for classifying educational objectives in terms of performance requirements and objectives, and (4) to develop a detailed plan of activity for Phase II of the SCOPE program. These two progress reports outline major accomplishments and developments during the first two quarters of SCOPE's first year of existance. (CH)

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PROGRESS REPORT #1

Project No. 8-0334
Grant No. OEG-0-8-080334-3736 (085)

A STUDY OF CURRICULUMS FOR OCCUPATIONAL PREPARATION AND EDUCATION.
(SCOPE Program: Phase I). Progress Report I and II.

2
Bruce W. Tuckman

3 Rutgers The State University
New Brunswick, New ~~Jersey~~

September, 1968

The research reported herein was performed pursuant to a grant with the Office of Education, U.S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

VT008100

U.S. Department of
Health, Education, and Welfare

4 *Office of Education (DHEW), Washington D.C.
Bureau of Research

RMQ66000.

ACKNOWLEDGEMENTS

The principal investigator would like to acknowledge the contributions of his secretary, Mrs. Sheila O'Bryan, and his two research assistants, Mrs. Carol Porter and Mr. Ricardo Grippaldi.

Special thanks is also given to Mr. Joseph H. Casello, Assistant to the Director, who authored this report.

PREFACE

SCOPE is an acronym for the Study of Curriculums for Occupational Preparation and Education. Its major objective is to coördinate and contribute to a national curriculum development effort at the secondary school level aimed at increasing the relevance of high school education for the large majority of our youth who must seek employment or further job training upon graduation.

The first phase of the SCOPE Program is CONECT, an acronym standing for the Coordination of Occupational and Non-occupational Curriculums and Technologies. The objectives of this first phase are as follows:

(1) To establish a functional communication link among the State-supported Vocational Curriculum Development Centers;

(2) To increase the familiarity of the directors of the above centers with recent advances in behavioral approaches to curriculum development, devices, and evaluation;

(3) To refine and test a scheme for classifying educational objectives in terms of the performance requirements and objectives rather than the subject-matter;

(4) To develop a detailed plan of activity for Phase II of the SCOPE Program, including the identification of staff and facility needs.

The SCOPE Program has aims which interface with those of a new Federally supported effort known as the Educational Systems of the '70's. The ES '70 program is an attempt to make an impact on the high school of the future by providing more closely for individual student needs, including those relevant to future employment opportunities. The notion of the truly integrated curriculum, i.e., one in which concepts common to different subject matters become the core of a curriculum rather than organizing the curriculum completely around the subject matters themselves, is at the heart of ES '70. It is here that the activities of SCOPE, as well as other University projects, will contribute to the overall programmatic approach. During the first phase of SCOPE, a process-object model for the integration of objectives will be refined, written about, and tested. In so doing, the SCOPE Program will be helping to provide the basis for a highly individualized and reality-oriented curriculum.

OF BUREAU OF RESEARCH NO. 8-0334
PERIOD: 6/24/68-9/24/68

Grant No. OEG-0-8-080334-
3736 (085)

RUTGERS UNIVERSITY

Date of Submission:
October 15, 1968

A STUDY OF CURRICULUMS FOR
OCCUPATIONAL PREPARATION AND
EDUCATION (SCOPE Program: Phase I)

BRUCE W. TUCKMAN

1. MAJOR ACTIVITIES AND ACCOMPLISHMENT DURING THIS PERIOD

Our initial accomplishment, a time-consuming series of negotiations and maneuverings involving most of July, was to secure housing for the SCOPE Project. We are pleased to announce that the SCOPE Center has been located in the WoodLawn Gatehouse, a beautiful site hidden among the regal and majestic trees on the Douglass Campus. In addition to an ever-present sense of history, with which this charming old structure is so replete, we are afforded the luxury of relative solitude in which to conduct our business.

The SCOPE brochure, our major instrument of introduction, has been printed (see enclosed copy). We are now in the process of mailing copies to the State Directors of Vocational-Technical Education, Curriculum Lab Directors, members of the ES '70 Program, and various other people who we think would be interested in our program. We have also drafted letters of introduction to be sent along with the brochure to the Curriculum Lab Directors and the State Directors of Vocational-Technical Education.

As a follow-up to our introductory materials, plans are being formulated for meeting the Curriculum Lab Directors. Schedules are being developed for visiting as many of the Labs as time and funds will allow. A suite has been reserved for the AVA Convention in Dallas during the second week of December so that we can also meet with the Lab Directors, hopefully many of those who we will not be able to see otherwise.

The SCOPE staff has been completed during this initial period. In addition to a full-time Assistant and secretary, two part-time graduate research assistants have been added. Their task will be to research literature on topics pertinent to the development of a set of behavioral objectives and process-object model.

1. (continued)

Two visitations worth mentioning occured during this initial period. Dr. Sidney High of the Bureau of Research and Mr. William Berndt, Senior Program Officer of the Curriculum Instructional Materials Program in the Office of Education, spent a day at the SCOPE Center early in September. The objectives of the SCOPE Project, their implementation, and the Project's role in the development of an integrated curriculum at the high school level were some of the topics discussed at this enlightening session.

The Manpower Training Skills Center in Newark was visisted in August by the Director and his Assistant. The trip included a tour of the plant, observation of some classes, discussions with teachers and students, and an interesting conversation with Mr. John Radvany, the chief administrator of the school. A return visit is planned for the near future.

In summation, the SCOPE Program is an operating reality. The foundation necessary for fulfilling the Program's objectives has been secured. We can now concern ourselves with realizing these objectives.

2. PROBLEMS

None to date

3. SIGNIFICANT FINDINGS AND EVENTS

None as yet

4. DISSEMINATION ACTIVITIES

You will find enclosed copies of the Project's first two incidental reports:

1. "Structural Analysis as an Aid to Curriculum Development"
2. "Analysis, Classification and Integration of Educational Objectives"

In addition to newspaper coverage, The *Research Bulletin* of the New Jersey School Development Council, Fall Edition, includes an article on the SCOPE Project.

5. CAPITAL EQUIPMENT ACQUISITIONS

None

6. FORMS

None

7. OTHER ACTIVITIES

None other than those mentioned in #1

8. STAFF SUMMARY

		Federal	Local		
Bruce W. Tuckman	Director	$1,926	$566	7/1-9/30	3/4 time
Joseph H. Casello	Assist. Dir.	2,924		7/1-9/30	full time
Ricardo Grippaldi	Res. Assist.	275		9/1-9/30	1/2 time
Carol Porter	Res. Assist.	275		9/1-9/30	1/2 time

9. FUTURE ACTIVITIES PLANNED FOR NEXT REPORTING PERIOD

Our efforts during the next three months will concentrate on developing a step-by-step process for establishing and maintaining an effective working relationship with the Curriculum Lab Directors. We realize that the success of our program depends largely on our ability to establish positive, cooperative and mutually respectful relationships with these people.

Our research assistants will continue their review of the literature pertinent to our purpose. Mr. Grippaldi will concentrate his efforts in the area of the structure of knowledge, while Mrs. Porter will research grouping practices in the secondary schools.

The SCOPE Project is also looking to subsidize one or two doctoral theses related to SCOPE and the secondary school curriculum. In this way we would be making a further contribution to education, as well as providing our own efforts with additional sources of information.

10. CERTIFICATION

Signature of Contract Officer

Date

Bruce W. Tuckman
Signature of Principal Investigator or Project Director

October 15, 1968
Date

SCOPE PERSONNEL

Dr. Bruce W. Tuckman, Director

1. Degrees

   B.A. - Rensselaer
   M.A. - Princeton
   Ph.D. - Princeton

2. Teaching and Related Experience Prior to this Project

   Naval Medical Research Institute - Research Psychologist

   University of Maryland - Instructor in social psych. and educational psych.

   Princeton University - Postdoctoral research

   Rutgers University - Teaching Social Psych. and Psych. of Personality

3. Specialization(s)

   Interaction processes in the school and classroom

   The structure of knowledge and the learning process

   Research design and measurement

   The psychology of the disadvantaged

   Vocational development

Mr. Joseph H. Casello, Assistant to the Director

1. Degrees

   B.A. - Trinity College
   M.A. - Trinity College
   Presently a doctoral candidate at Rutgers University

2. Teaching and Related Experience prior to the Project

SCOPE PERSONNEL (continued)

Rockville High School - Instructor of United States History
Rockville, Conn.

Tolland High School - Assistant Principal
Tolland, Conn.

3. Specialization(s)

Historiography

Educational administration

Mrs. Carol Porter, Research Assistant

1. Degrees

B.A. - State University of New York (Stony Brook)

2. Teaching and Related Experience Prior to this Project

one semester as a research assistant in experimental psychology

assistant to foreign student advisor (Dean of Student's staff)

3. Specialization(s)

Counseling and guidance

College level administration

Mr. Ricardo Grippaldi, Research Assistant

1. Degrees

B.A. - Seton Hall

2. Teaching and Related Experience Prior to this Project

none

3. Specialization(s)

working with disturbed children

group psychotherapy

APPENDIX

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SCOPE PROGRAM*

**Study of Curriculums for*
Occupational Preparation
and Education

A Research Activity of the
Department of Vocational-Technical Education
funded by the
U. S. Office of Education
under Grant No. OE 8-0334

BRUCE W. TUCKMAN, Ph.D., *Director*
SCOPE Center
Douglass-Wood Lawn Gatehouse
Rutgers University
New Brunswick, New Jersey 08903
Phone: 201-846-4628

Project No.
8-0334

SCOPE PROGRAM

SCOPE is an acronym for the Study of Curriculums for Occupational Preparation and Education. Its major objective is to coordinate and contribute to a national curriculum development effort at the secondary school level aimed at increasing the relevance of high school education for the large majority of our youth who must seek employment (or further job training) upon graduation.

OBJECTIVES, PHASE I

Funding has been obtained from the U. S. Office of Education for the first phase of the SCOPE Program, named Project CONECT, another acronym standing for the Coordination of Occupational and Non-occupational Curriculums and Technologies. The objectives of this first phase of the SCOPE Program are as follows:

(1) To establish a functional communication link between the state-supported vocational curriculum development centers.

(2) To increase the familiarity of the directors of the above centers with recent advances in behavioral approaches to curriculum development, devices, and evaluation.

(3) To refine and test a scheme for classifying educational objectives in terms of the performance requirements of each objective rather than the subject-matter.

(4) To develop a detailed plan of activity for Phase II of the SCOPE Program, including the identification of staff and facility needs.

SCOPE AND THE VOCATIONAL CURRICULUM CENTERS

There are approximately 15 State-supported vocational curriculum development centers throughout the country that have been actively involved in the development of curriculum materials. The first task of SCOPE will be to assist these centers by helping to establish better communication and cooperation among them and by providing information concerning present modernizing trends in the production of curriculum materials.

To this end, two conferences will be held at Rutgers in the spring of 1969 so that the curriculum laboratory directors can participate in discussions concerning the latest developments in curriculum theory and educational technology.

The final task of the first phase of SCOPE will be to plan for the SCOPE Center to participate in the development and coordination of national efforts to move the curriculum toward greater relevance for more students.

THE INTEGRATED CURRICULUM

The SCOPE Program also has aims which interface with those of a new Federally-supported effort known as the Educational Systems of the '70's. The ES '70 program is an attempt to make an impact on the high school of the future by providing more closely for individual student needs, including those relevant to future employment opportunities. Seventeen participating school districts are attempting to develop and implement such promising innovations as the integrated curriculum, individualized instruction, etc. The notion of the truly integrated curriculum, i.e., one in which concepts common to different subject matters become the core of a curriculum rather than organizing the curriculum around the subject matters themselves, is at the heart of ES '70. It is here that the activities of SCOPE, as well as other University projects, will contribute to the overall programmatic approach.

Present plans in the ES '70 program call for an attempt to reorganize the high school curriculum in a direction away from separation of subject matter based on learning objectives. To this end, many subject matter experts may be called upon to identify the educational objectives included in their area of the high school curriculum. Thus, given the "pieces," it will be necessary to put them together in some meaningful way. The process-object model for the integration of objectives is an attempt to structure learning experiences in a manner more consistent with their application to the tasks of life than the present subject matter breakdown. During the first phase of SCOPE, this scheme will be refined, written about, and tested.

SCOPE AND THE SYSTEM

SCOPE will be concerned with a number of current curriculum practices at the high school level. Activity aimed at the development of an integrated curriculum fortunately will enable the SCOPE Project to confront many of these problem areas, such as ability grouping and tracking, the status of vocational offerings, curriculum evaluation, etc. Such a confrontation will focus on the promulgation of solutions aimed at more Rigorous, Respectable, and Relevant programs of studies for tomorrow's students.

SCOPE AND THE INDIVIDUAL STUDENT

The notions of systematic specification of educational goals in behavioral terms, hierarchial analysis of knowledge and competence, contingency management and the like are approaches that behaviorally-oriented psychologists and educators are attempting to introduce into the mainstream of curriculum development. Anchoring educational activities to the specific behavioral goals which they are intended to produce provides the basis for a highly individualized and reality-oriented curriculum. Moreover, it does not, as some have claimed, reduce the range of individual differences. By providing slow learners with a more adequate grasp of basic concepts, the behaviorally-structured curriculum increases their potential for unique individual development. Moreover, rapid learners can proceed at their own pace and can go "beyond" the curriculum.

Individual instruction, the integrated curriculum, the career-oriented curriculum (one which painlessly and respectably exposes more students to skill training and development) may seem like pipe dreams today. The SCOPE Program is an effort to bring them closer to the reality of tomorrow.

PROJECT DIRECTOR
DR. BRUCE W. TUCKMAN

B.S.	Rensselaer
M.A.	Princeton University
Ph.D.	Princeton University

Associate Professor of Education

Departments of Vocational-Technical
Education and Educational Psychology

ASSISTANT TO THE DIRECTOR
MR. JOSEPH H. CASELLO

B.A.	Trinity College
M.A.	Trinity College

Formerly Assistant Principal—
Tolland High School, Tolland, Connecticut

Presently a Doctoral Candidate
in Vocational Education at Rutgers

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DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
Office of Education
Washington, D.C. 20202

MEMORANDUM September 27, 1968

Sent to: State Directors of Vocational Education

Sent by: David S. Bushnell, Director
Division of Comprehensive and
Vocational Education Research

Leon P. Minear, Director
Division of Vocational and
Technical Education

Subject: Initiation of the SCOPE Project at Rutgers University
(U.S.O.E. Project No. 8-0334).

The SCOPE Project (Study of Curriculums for Occupational Preparation thru Education), which the United States Office of Education is pleased to sponsor, is now operative at Rutgers University. Among its functions will be the important task of helping to establish a viable communications link among the many State-supported Curriculum Development Laboratories. This is an important objective, for it will enable the Curriculum Labs to become an even more potent force in meeting tomorrow's educational needs.

We attach great importance to SCOPE because we anticipate that the field of vocational-technical education will profit from coordination and cooperation among the States in the important domain of curriculum development. It is our hope that you, as the Directors of Vocational and Technical Education and persons having the responsibility for vocational curriculum development in your States, will afford Dr. Bruce Tuckman and his SCOPE staff your fullest cooperation. In doing so, you will be furthering our joint efforts and programs in the national cause of vocational curriculum development.

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RUTGERS · THE STATE UNIVERSITY

NEW BRUNSWICK, NEW JERSEY 08903

SCOPE Center
Douglass-WoodLawn Gatehouse
(201) 846-4628

September 27, 1968

The SCOPE Center (Study of Curriculums for Occupational Preparation and Education) is now operative. With your approval, along with that of the other State Directors of Vocational-Technical Education, we would like to use our Center and the Federal funds at our disposal to help the State-supported Curriculum Development Laboratories establish a viable communications link among themselves. The Federal Government has authorized funds for this endeavor because it believes that these Laboratories can become an even more potent national resource if the proper catalyst for interlocking were provided. We feel, as I am sure you do, that the entire field of vocational-technical education would benefit from such intensified interaction.

We would also like to use our resources to get the Curriculum Labs to conceive of and pursue a national role in curriculum development. There is an urgent need to increase the relevance of high school education for the large majority of our youth who must seek employment or further job training upon graduation. Tied to this necessity is that of extending vocational offerings to more students, particularly those in comprehensive high schools. To accomplish such objectives would require not only a proliferation of vocational curriculums, but the breaking of new ground in vocational curriculum development. Collectively, the Curriculum Labs have the means to be a strong and recognizable influence in such a movement. We would like to cooperate and be a part of that challenge with them. The

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time for a vocational curriculum thrust in American education is now. Together we can do much to implement that thrust.

Our schedule calls for a visitation by SCOPE personnel of as many of the Curriculums Labs as time and funds will allow. These visitations will be followed by two conferences at Rutgers University early next spring, their purpose being to allow the various Lab Directors to get acquainted, discuss the possibility of a communications network, and converse with other specialists about the latest advances in curriculum theory and educational technology. If you do not object, we would like to carry on direct correspondence with the Curriculum Lab Directors. In addition, we would appreciate it if you would notify the Curriculum Lab Director of your endorsement of this Project, and urge them to attend our spring conferences.

In closing, let me express my sincere appreciation for your cooperation. Also, please accept my invitation to join us at the spring conferences, and at our suite in the Statler-Hilton Hotel during the AVA Convention. I look forward to meeting with you in the near future.

Cordially,

Dr. Bruce W. Tuckman
Director

Mr. Joseph H. Casello
Assistant to the Director

BWT/JHC/sjo'b

enclosure

1.6.

RUTGERS · THE STATE UNIVERSITY

NEW BRUNSWICK, NEW JERSEY 08903
SCOPE Center
Douglass-WoodLawn Gatehouse
(201) 846-4628

September 27, 1968

The SCOPE Center (Study of Curriculums for Occupational Preparation and Education) is now operative. Our initial focus is on helping you and the other Directors of the State-supported Curriculum Development Labs establish a viable communications link among yourselves. The Federal Government has authorized funds for such an effort because it realizes that these laboratories can become an even more potent national resource if the proper catalyst for interlocking were provided. We feel, as I am sure you and your fellow Directors do, that not only would the Curriculum Centers profit from such interaction, but the entire field of vocational-technical education as well would gain from such a combined thrust. Our contribution to developing tomorrow's education would be that much greater.

To implement our effort at helping you to coordinate, two conferences are being planned for Rutgers University during the early spring of 1969. The initial conference will provide you with an opportunity to meet with the other lab Directors and establish some form of network if it is your desire to do so. The second meeting will enable you to converse with educational leaders from a variety of specialties about the latest advances in curriculum theory and educational technology and their implications for vocational education. Hopefully, you and the other Directors will be in attendance on both occasions. The SCOPE Project will provide funds for your travel and lodging costs, as well as providing you with a stipend for each conference.

My assistant and I will attend the AVA Conference in Dallas during the first week in December. We hope many of you will visit with us in our accommodations at the Statler-Hilton Hotel so that we can get to know each other on a personal basis. We

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would also like to visit as many of the Curriculum Laboratories as time and funds allow (which unfortunately will not be all of them). Each center that we can visit will be contacted shortly to make specific arrangements for such visits. In the meantime, we would appreciate receiving any brochures, pamphlets, etc., that you feel would be informative and useful to us in describing the mission and activities of your Center.

SCOPE's ultimate aim is to assist in increasing the relevance of high school education for the large majority of our youth who must seek employment or further job training upon graduation, a lofty but attainable goal. We, as you, realize that vocational education has achieved some noteworthy success in pursuing this goal for half a century. The present effort in vocational education, with which we would like to identify, is to extend vocational offerings to more students, particularly those in comprehensive high schools. We feel that all students should have some exposure to the world of work, if for no other reasons than to help them learn their "academic" subjects and be able to apply them. This would require not only a proliferation of vocational curriculums, but the breaking of new ground in vocational curriculum development.

We would like to use our Center and the Federal funds at our disposal to help you conceive of and pursue a national role. Collectively you have the means to be a strong and recognizable influence on the national scene. We would like to cooperate and be a part of this challenge with you.

I look forward to meeting you and discussing our common interests and the role we might play in your coordinated activities. I am particularly interested in understanding and appreciating your feelings and ideas concerning the notion of a network of the Curriculum Labs. The time for a vocational curriculum thrust in American education is now. Together we can do much to implement that thrust.

Please write back and give me your reaction to our plans. I hope to see you soon.

Cordially,

Dr. Bruce W. Tuckman Director	Mr. Joseph H. Casello Assistant to the Director

BWT/JHC/sjo'b
enclosure

18.

RUTGERS · THE STATE UNIVERSITY

NEW BRUNSWICK, NEW JERSEY 08903
SCOPE Center
Douglass-WoodLawn Gatehouse
(201) 846-4628

September 27, 1968

I need your assistance. The SCOPE Center (Study of Curriculums for Occupational Preparation and Education) has been initiated through Federal funds to carry on work in the area of vocational-technical curriculum. Realizing that the State-supported Curriculum Labs play a vital role in this area, I am most anxious to know more about your operations. If you would be kind enough to take a few moments from your busy schedule and fill out the questionnaire, I think you would be doing the field of vocational-technical education a great favor.

I appreciate your cooperation. Please feel free to call on SCOPE at any time if you think we can be of service to you.

Respectfully,

Joseph H. Casello
Assistant to the Director

JHC:sjo'b

19.

Name of Lab______________________________

QUESTIONNAIRE TO BE COMPLETED BY CURRICULUM LAB DIRECTORS

1. Approximate Annual Budget______________________
2. Number of Employees____________________________
3. Size of Facilities (sq. footage)_______________
4. Approximate Capital Value of Equipment_______
5. Brief Description of Machinery_______________

____

____

____

____

6. Areas of Specialization (check those appropriate)

Agri.	
T & I	
Business & Office	
Distributive Education	
Home Economics	
Health	
Technical	
Vocational Guidance	

Others____________

____

____

____

____

____

7. Approximate number of publications on file_______
8. Approximate number of publications per year______
9. Annual gross receipts from annual sale of literature______
10. Are publications available to out of state parties?______

PROGRESS REPORT II

Project No. 8-0334
Grant No. OEG-0-8-080334-3736 (085)

A STUDY OF CURRICULUMS FOR OCCUPATIONAL PREPARATION AND EDUCATION

(Scope Program: Phase I)

Bruce W. Tuckman

Rutgers University
New Brunswick, New Jersey

December, 1968

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U.S. Department of
Health, Education, and Welfare

Office of Education
Bureau of Research

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

ACKNOWLEDGEMENTS

The principal investigator would like to acknowledge the contributions of his secretary, Mrs. Sheila O'Bryan, and clerk-typist, Mrs. Noreen Richardson for the preparation of this report.

Special thanks go to Mrs. Carol Porter and Mr. Ricardo Grippaldi, research assistants, who prepared major sections of this report.

Last but not least, Mr. Joseph H. Casello, Assistant to the Director, has earned a debt of thanks for taking the responsibility for the preparation of this report.

PREFACE

SCOPE is an acronym for the Study of Curriculums for Occupational Preparation and Education. Its major objective is to coordinate and contribute to a national curriculum development effort at the secondary school level aimed at increasing the relevance of high school education for the large majority of our youth who must seek employment or further job training upon graduation.

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(1) To establish a functional communication link among the State-supported Vocational Curriculum Development Centers;

(2) To increase the familiarity of the directors of the above centers with recent advances in behavioral approaches to curriculum development, devices, and evaluation;

(3) To refine and test a scheme for classifying educational objectives in terms of the performance requirements and objectives rather than the subject-matter;

(4) To develop a detailed plan of activity for Phase II of the SCOPE Program, including the identification of staff and facility needs.

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OF BUREAU OF RESEARCH NO. 8-0334

RUTGERS UNIVERSITY

A STUDY OF CURRICULUMS FOR
OCCUPATIONAL PREPARATION
AND EDUCATION (SCOPE PROGRAM: PHASE I)

BRUCE W. TUCKMAN

GRANT NO. OEG-0-8-080334-3736 (085)

DATE OF SUBMISSION:

January 20, 1969

I. MAJOR ACTIVITIES AND ACCOMPLISHMENTS DURING THIS PERIOD

The second quarter of SCOPE's first year of existence found the SCOPE staff busy with establishing personal contact with the directors of the state-supported curriculum laboratories in an effort to form some viable confederation among them, and working toward the development and perfection of a process-object model for the integration of the eventual behavioral objectives that will be determined for each discipline. The logistics for our efforts included numerous trips and conferences, the most important of which are discussed at this time.

MAN-EDUCATION-WORK CONFERENCE

Dr. Tuckman and Mr. Casello attended the "Man-Education-Work" Conference at Rutgers University on September 30 and October 1. Sponsored jointly by the Department of Vocational-Technical Education at Rutgers, and the Center for Studies in Vocational and Technical Education at the University of Wisconsin, this important program was:

> ...one of six regional conferences designed to bring together representatives of business, labor, government, and education and other interested citizen groups for a discussion of the 1968 Report of the National Advisory Commission on Vocational Education...
>
> The regional conferences are intended to provide opportunity for informed discussion and exchange of viewpoints about the issues raised by this report. A final report synthesizing the discussions of the regional conferences will be published and made available to conference participants and others.

Talks were given by Dr. Martin Essex and Mr. Leonard Rosenberg, Chairman and member respectively of the Advisory Council on Vocational Education, Dr. Gerald Leighbody of the State University of New York at Buffalo, and Marvin Feldman, Educational Director of the Ford Foundation. Participants were broken into groups to react to three questions:

- To what extent should vocational and technical education be organized and administered separately from general education programs?
- How can education for work become more visible as an objective of school and college programs?
- How can counseling and placement activities best serve the objectives of vocational-technical education?

Responses from the various groups seemed to express a general feeling that there must be a different approach to vocational education rather than just more of the same, redirection must come both in program and curriculum, there should be no segregation of vocational and general education, and the bridge between education and work must be built from both ends. Strong sentiments were expressed in favor of the behavioral objective approach to curriculum development, similar to that being attempted by SCOPE.

JAMESBURG HOME FOR BOYS

On October 22, Dr. Tuckman and Mr. Casello journeyed to the Jamesburg Home for Boys as the guests of Mr. Houston, Director at the Home, and Dr. Bodhan Cymballisty, the psychological examiner at the Home. The administration is very anxious to develop a vocational program so that the boys will have some job-entry skills upon departure from the institution, and to develop some criteria for evaluating various programs already adopted. A lengthy discussion led to the following possibilities:

(1) The establishment of an internship for a student in the Vocational-Technical Department of the Graduate School of Education at Rutgers University, the

purpose being for the student to assist in developing a financially and educationally sound vocational program for the school, including new courses such as ornamental horticulture, food services, etc.

(2) The establishment of a dissertation study for a student in the Department of Educational Psychology in which certain aspects of the school program would be evaluated. One possibility for such a dissertation would be the comparison of homogeneous and heterogeneous personality groupings in the living cabins as a new experiment in the Jamesburg program.

(3) The establishment of a system for the evaluation of the individual programs within the school. Dr. Tuckman would work closely with the school psychologist in an advisory capacity.

(4) The location of assistance from within the Graduate School of Education at Rutgers University in helping Jamesburg to draft proposals for Federal aid.

(5) The establishment of an internship program for students in a teacher training program.

The administration at Jamesburg was most receptive to the suggestions and possible future assistance advocated by the SCOPE staff. There is great hope on our part that the SCOPE Project will be able to use the Jamesburg facilities for research pertinent to the process-object model for determining behavioral objectives which we are trying to develop.

SCOPE ADVISORY COMMITTEE

The University Advisory Committee to the SCOPE Project was organized during this quarter. The gentlemen who have generously consented to give us their time and talents are:

Dr. Charles W. Patrick
Assistant to the President
Rutgers University

Dr. James R. Watson
Assistant to the President
Rutgers University

Dr. Ernest Duncan, Chairman
Dept. of Curriculum & Instruction
Graduate School of Education
Rutgers University

Dr. Frank Scherer, Chairman
Dept. of School Administration & Supervision
Graduate School of Education
Rutgers University

Dr. Jack Bardon, Chairman
Dept. of Educational Psychology
Graduate School of Education
Rutgers University

Dr. James Wheeler, Chairman
Dept. of Social & Philosophical Foundations
Graduate School of Education
Rutgers University

Dr. Carl J. Schaefer, Chairman
Dept. of Vocational-Technical Education
Graduate School of Education
Rutgers University

Dr. Herbert Levine, Director
Labor Relations Center
Herrmann Labor Education Center
Rutgers University

Dr. Earnest McMahon, Dean
University Extension Division
University College
Rutgers University

Dr. Werner Boehm, Dean
Graduate School of Social Work
Rutgers University

Dr. Milton Schwebel, Dean
Graduate School of Education
Rutgers University

Dr. Donald H. Amick, Assistant Dean
Graduate School of Education
Rutgers University

Mr. O. Clayton Johnson
Assistant to the Dean
Graduate School of Education
Rutgers University

Dr. Margery Foster, Dean
Douglass College
Rutgers University

Dr. George Pallrand, Director
Secondary School Science Project
Graduate School of Education
Rutgers University

Dr. Martin Haberman, Director
Pre-Service Teacher Education
Graduate School of Education
Rutgers University

On October 29, Dr. Tuckman, Mr. Casello, and the Project's two graduate assistants, Mrs. Carol Porter and Mr. Ricardo Grippaldi, met with members of the Advisory Committee for lunch. The occasion was used by Dr. Tuckman to discuss the nature of the SCOPE Project in detail and to outline its objectives. A question-and-answer period produced some stimulating interaction.

Present plans call for the Advisory Committee to be used by the SCOPE staff as a resource group. The varied experiences and expertise of the committee members make them a most valuable addition to the SCOPE family. We are pleased to have the consultation of such a capable group of educators, and look forward to working with them often in the near future.

HIGH SCHOOL REPRESENTATIVES

On October 31, Dr. Tuckman, Mr. Casello, and graduate assistant, Mrs. Carol Porter, hosted a luncheon for representatives from the following five New Jersey school systems:

Mr. Paul A. Shelly
Assistant Superintendent of Schools
Montclair, New Jersey

Mr. John Rosser
Administrative Assistant
Willingboro, New Jersey

Mr. Nelson Gray
Administrative Assistant
Willingboro, New Jersey

Mr. Theodore Schor
Superintendent of Schools
Piscataway, New Jersey

Mr. Edward Moskowitz
Vocational Coordinator
Hackensack, New Jersey

Mr. Donald Hoagland
Superintendent
Monmouth County Vocational School
Freehold, New Jersey

The purpose of the meeting was to familiarize these gentlemen with the SCOPE Project and to glean their reactions to our efforts. A positive reaction on their part encouraged Dr. Tuckman to request permission to use their school systems for the purpose of undertaking an exploratory study of the characteristics and effects of ability grouping on students, primarily at the secondary level. (See Appendix 1) This request was enthusiastically received by all of the representatives, and plans are now underway to begin this study sometime in the spring of next year. It is the opinion of the SCOPE staff that the enthusiastic support received from these people for our efforts will enable us to use their facilities as experimental laboratories and resource centers for any needed data pertaining to our study of secondary school curricula.

SOUTHERN TRIP TO CURRICULUM LABORATORIES

During the week of November 12, Dr. Tuckman and Mr. Casello flew to the State-supported curriculum laboratories at Raleigh, North Carolina, Clemson, South Carolina, and Murfreesboro, Tennessee. In addition to being the recipients of generous southern hospitality, Dr. Tuckman and Mr. Casello were afforded an opportunity to meet with the director and staff of each lab to present the SCOPE Project and its objectives in great detail, to gain some awareness of the philosophies and problems of each director, and to begin to identify the issues for inclusion in the format for the spring conferences at Rutgers University for the laboratory directors. A tour was made of the facilities at each laboratory, as well as the communities in which they are located. Visits were also made to Duke University, North Carolina State University, Clemson University, Middle Tennessee State University, and the W.W. Holding Technical Institute, where there was a thorough exposure to the vocational-technical program offered at this community college.

The trip to the three southern curriculum laboratories was most beneficial in that it gave SCOPE staff members an opportunity to meet three of the lab directors personally, to evaluate their reactions to our efforts to help form some confederation among them, and to prepare for the spring conferences. It became quite apparent, for example, that the following items must be discussed at length in a meeting of the lab directors:

(1) the advantages that would accrue from some sort of communication network on their part

(2) the mechanics of such a union

(3) the possibility of a common repository to serve as a printing and distribution center

(4) the possibility of expanding the original planning group to include other existing laboratories

(5) the different administrative organizations and formats that exists among the laboratories

There also appears to be some need for the SCOPE staff to look more closely at PPBS and PERT management structures. Successful completion of our efforts to help forge a strong union among the curriculum laboratories will depend largely upon a well defined, carefully implemented modus operandi.

AEROSPACE EDUCATIONAL FOUNDATION PROGRAM

On November 18, 19, and 20, Mr. Joseph Casello, Assistant to the Director of SCOPE, attended the National Laboratory for the Advancement of Education program "Individualized Learning for the Inner City," sponsored by the Aerospace Education Foundation. This was a new medium of communications to demonstrate, analyze, and evaluate the Nation's most outstanding examples of innovative classroom projects regarding individualized learning. The program included four outstanding features:

(1) Classroom Demonstrations - actual classroom experiences demonstrated by teachers who have provided effective changes in the learning process through innovative concepts and techniques, covering all grade levels from pre-school through adult education - and a wide range of subject areas

(2) Three-Phase Seminar - featuring reports and panel discussions on actual results achieved in the movement from classical group instruction to self-paced individualized learning - with concentration on education's role in solving urban problems

(3) Exposition - industry displays and demonstrations of products and services complementing the subject areas covered in the Classroom Demonstrations and Seminar Sessions - with the Exposition areas adjacent to the conference rooms - and a program schedule which not only encouraged but required multiple visits to the Exposition

(4) Talk-Back Sessions - to enhance personal involvement, each evening of the conference was devoted to a follow-on question-and-answer discussion period with the principals involved in the Classroom Demonstrations and Seminar Sessions, and the Industry representatives as well.

The presentation was well received by the 1,500 participants. The speeches and demonstrations were stimulating, the comments by the reaction panels were incisive, and the program was well balanced between listening, viewing, and participating. It was encouraging to observe that changes in the learning process are on the march, and that effective innovation is proving to be a realistic goal.

AVA CONVENTION

During the week of December 9, Dr. Tuckman and Mr. Casello attended the AVA Convention in Dallas, Texas. The trip proved to be an excellent opportunity for disseminating information on the SCOPE Project and gathering data regarding progress in the field of vocational-technical education. Dr. Byrl Shoemaker, State Director of Vocational Education in Ohio, presented the SCOPE Program to the state directors at their annual meeting. Dr. Tuckman presented two papers concerning research methods, while Mr. Casello met with members of the AVA Agricultural Division Professional Information Committee and discussed SCOPE and curriculum laboratories in general.

The trip to Dallas also afforded the SCOPE staff an opportunity to develop further the communication network among the curriculum lab directors. A meeting was held at the SCOPE suite for all of the lab directors in attendance. A dozen directors came together, established personal contact, conferred concerning their common policies and problems, discussed the possibility of a union, and offered suggestions for the organization of the spring conferences at Rutgers University. A solid foundation has been laid for the spring conferences and the confederation of curriculum laboratories. Moreover, the SCOPE personnel now has some insight into the problems common to all of the laboratories and the issues which must be resolved before a viable communication network can become operative among them.

Research

During the second quarter our two research assistants involved themselves in a study of ability grouping, the development of a model, and integrating behavioral objectives. Their reports concerning their activities are included at this point.

THE DEVELOPMENT OF A MODEL FOR BEHAVIORAL OBJECTIVES

In development of a workable taxonomy of behavioral objectives, the first step undertaken was a research review of all known classification systems pertinent to our domain of interest. Books, journals, etc. were surveyed; this included the fields of education, psychology, and other humanities as well as other appropriate areas such as systems analysis. (See References).

The literature did not contain much on the subject of taxonomies specifically; most of the material was of a general, abstract nature. We were interested in developing a detailed, workable taxonomy that could be applied to the creation of a curriculum. The most detailed and recent works along this line were the Bloom (et al.) and Krathwohl (et al.) taxonomies of educational objectives regarding the cognitive and affective domains respectively. (Figures 1 and 2). Taking the Tuckman process-object scheme for classifying educational objectives (Figure 3) as our starting base, we attempted to develop a model that would incorporate the most complete, diversified categorizations. It was felt that a three-dimensional model might best provide this.

The first model (Figure 4) depicted the goals considered basic for each object and the process whereby this could be acquired. The next step was to determine which verbs would best fit these categories. Model II was evolved (Figure 5) which utilized the above-mentioned taxonomies as well as a newly proposed taxonomy by Yagi (et al.) (Figure 6). Modification of this led to Model III (Figure 7) which was believed to be more concise and definitive. Discussion/Evaluation of this model in conjunction with our objectives resulted in the conclusion that, because of the traditional nature, present establishment and overlapping subject content of school curriculums, a tri-dimensional model would not be practical, rather, a linear categorization appeared to be the most practical.

We then turned to the task of developing a listing of verbs (Appendix A) which would account for all the basic operations that are involved in learning. This listing was refined and broken down into six major categories (Perceptual, Thinking, Computational, Communication, Interactional, and Manipulation) which covered the major aspects involved in an individual's reaction to his environment. (Appendix B). While evaluation of this latest model continues, it was decided that we should begin to test our categorizations. To this end, we obtained games which require the solitary participant to utilize perceptual, conceptual, and motor skills. With these tasks, we intend to determine what processes are required in areas such as problem solving that have wide-range application in education as well as the daily experiences of life.

Figure 1

BLOOM TAXONOMY
(a condensed version)

1.00 KNOWLEDGE

- 1.10 Knowledge of Specifics
  - 1.11 Knowledge of Terminology
  - 1.12 Knowledge of Specific Facts
- 1.20 Knowledge of Ways and Means of Dealing with Specifics
  - 1.21 Knowledge of Conventions
  - 1.22 Knowledge of Trends and Sequences
  - 1.23 Knowledge of Classifications and Categories
  - 1.24 Knowledge of Criteria
  - 1.25 Knowledge of Methodology
- 1.30 Knowledge of the Universals and Abstractions in a Field
  - 1.31 Knowledge of Principles and Generalizations
  - 1.32 Knowledge of Theories and Structures

2.00 COMPREHENSION

- 2.10 Translation
- 2.20 Interpretation
- 2.30 Extrapolation

3.00 APPLICATION

4.00 ANALYSIS

- 4.10 Analysis of Elements
- 4.20 Analysis of Relationships
- 4.30 Analysis of Organizational Principles

5.00 SYNTHESIS

- 5.10 Production of a Unique Communication
- 5.20 Production of a Plan, or Proposed Set of Operations
- 5.30 Derivation of a Set of Abstract Relations

6.00 EVALUATION

- 6.10 Judgments in Terms of Internal Evidence
- 6.20 Judgments in Terms of External Criteria

Figure 2

KRATHWOHL TAXONOMY
(a condensed version)

1.0 RECEIVING (ATTENDING)

1.1 Awareness
1.2 Willingness to Receive
1.3 Controlled or Selected Attention

2.0 RESPONDING

2.1 Acquiescence in Responding
2.2 Willingness to Respond
2.3 Satisfaction in Response

3.0 VALUING

3.1 Acceptance of a Value
3.2 Preference for a Value
3.3 Commitment

4.0 ORGANIZATION

4.1 Conceptualization of a Value
4.2 Organization of a Value System

5.0 CHARACTERIZATION BY A VALUE OR VALUE COMPLEX

5.1 Generalized Set
5.2 Characterization

Figure 3

THE PROCESS-OBJECT SCHEME FOR CLASSIFYING EDUCATIONAL OBJECTIVES

	OBJECT				
PROCESS	SYMBOLS (1)	IDEAS (2)	THINGS (3)	PEOPLE (4)	SELF (5)
(1) PERCEPTION					
(2) CONCEPTUALIZATION					
(3) APPLICATION					
(4) EVALUATION					
(5) MANIPULATION					

Figure 4

MODEL I

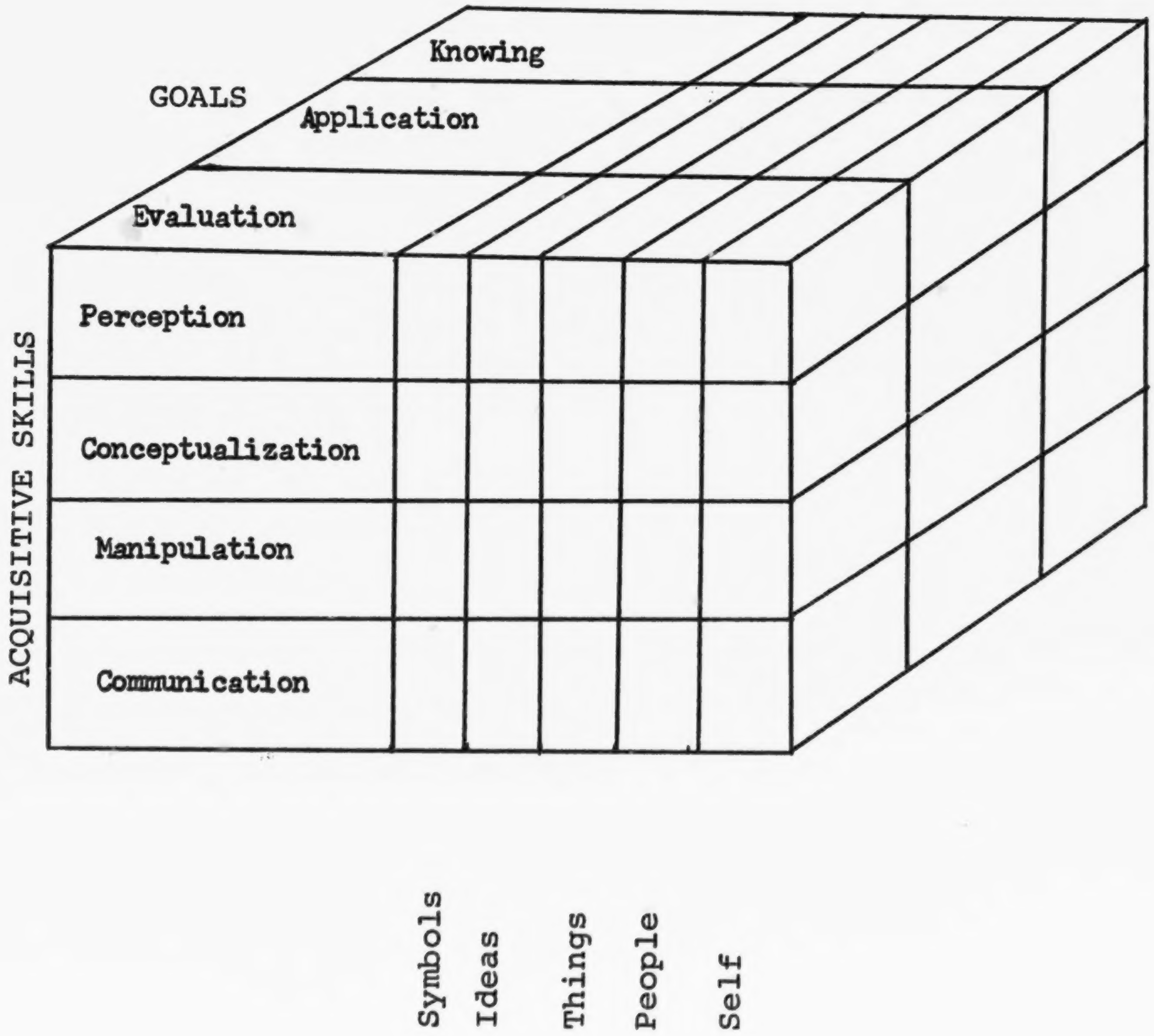

GOALS
Knowing
Application
Evaluation
ACQUISITIVE SKILLS
Perception
Conceptualization
Manipulation
Communication
Symbols
Ideas
Things
People
Self

Figure 5

MODEL II

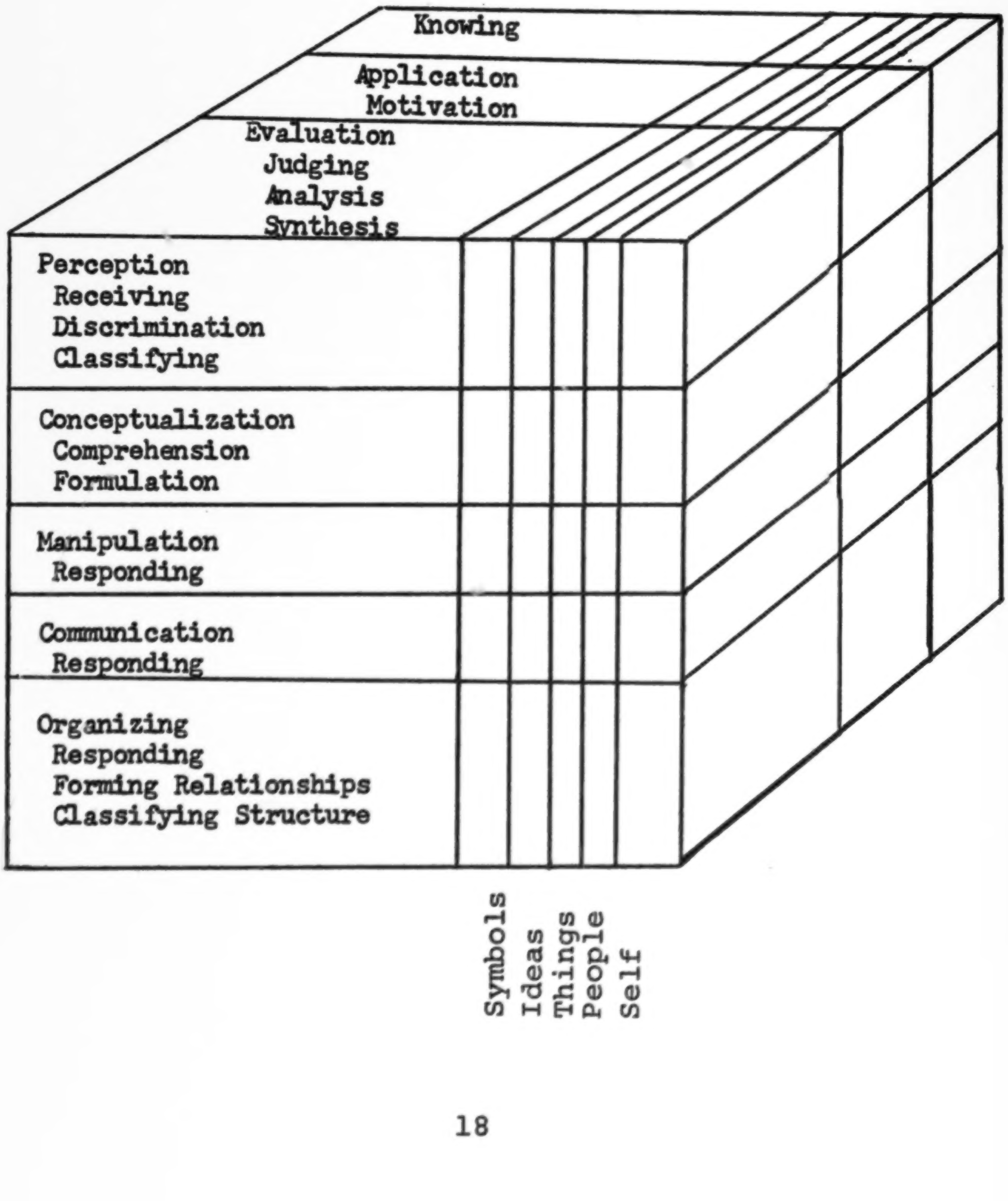
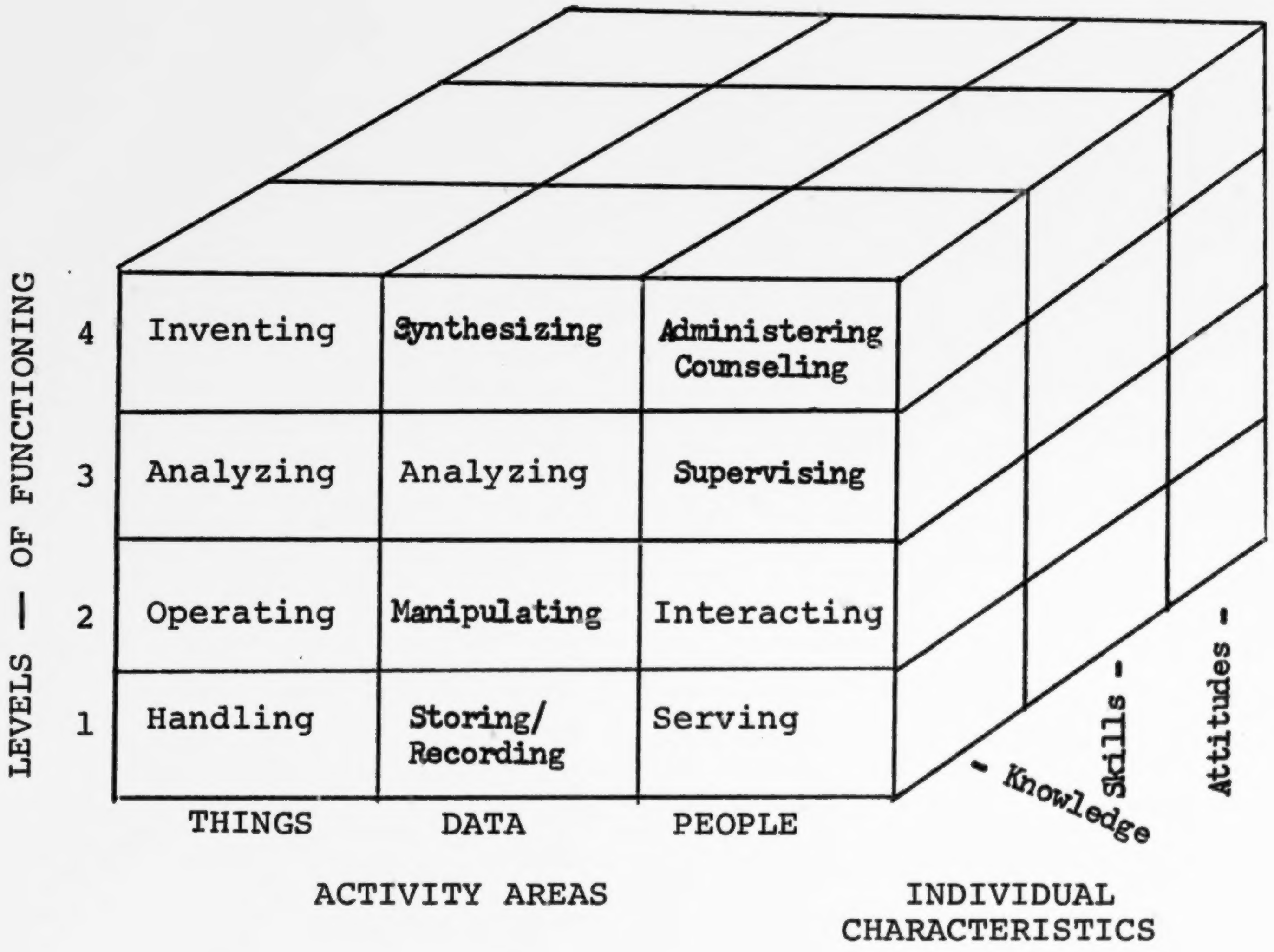

Knowing
Application
Motivation
Evaluation
Judging
Analysis
Synthesis
Perception
Receiving
Discrimination
Classifying
Conceptualization
Comprehension
Formulation
Manipulation
Responding
Communication
Responding
Organizing
Responding
Forming Relationships
Classifying Structure
Symbols
Ideas
Things
People
Self

Figure 6

THREE DIMENSIONAL REPRESENTATION OF TAXONOMY

(After Yagi, K. et al. The design and evaluation of vocational technical education curricula through functional job analysis. Project #6-1659, Grant No. OEG-2-6-061-659-2085. George Washington University, August 1968.)



LEVELS — OF FUNCTIONING	THINGS	DATA	PEOPLE
4	Inventing	Synthesizing	Administering Counseling
3	Analyzing	Analyzing	Supervising
2	Operating	Manipulating	Interacting
1	Handling	Storing/ Recording	Serving

ACTIVITY AREAS
- Knowledge
Skills -
Attitudes -
INDIVIDUAL CHARACTERISTICS

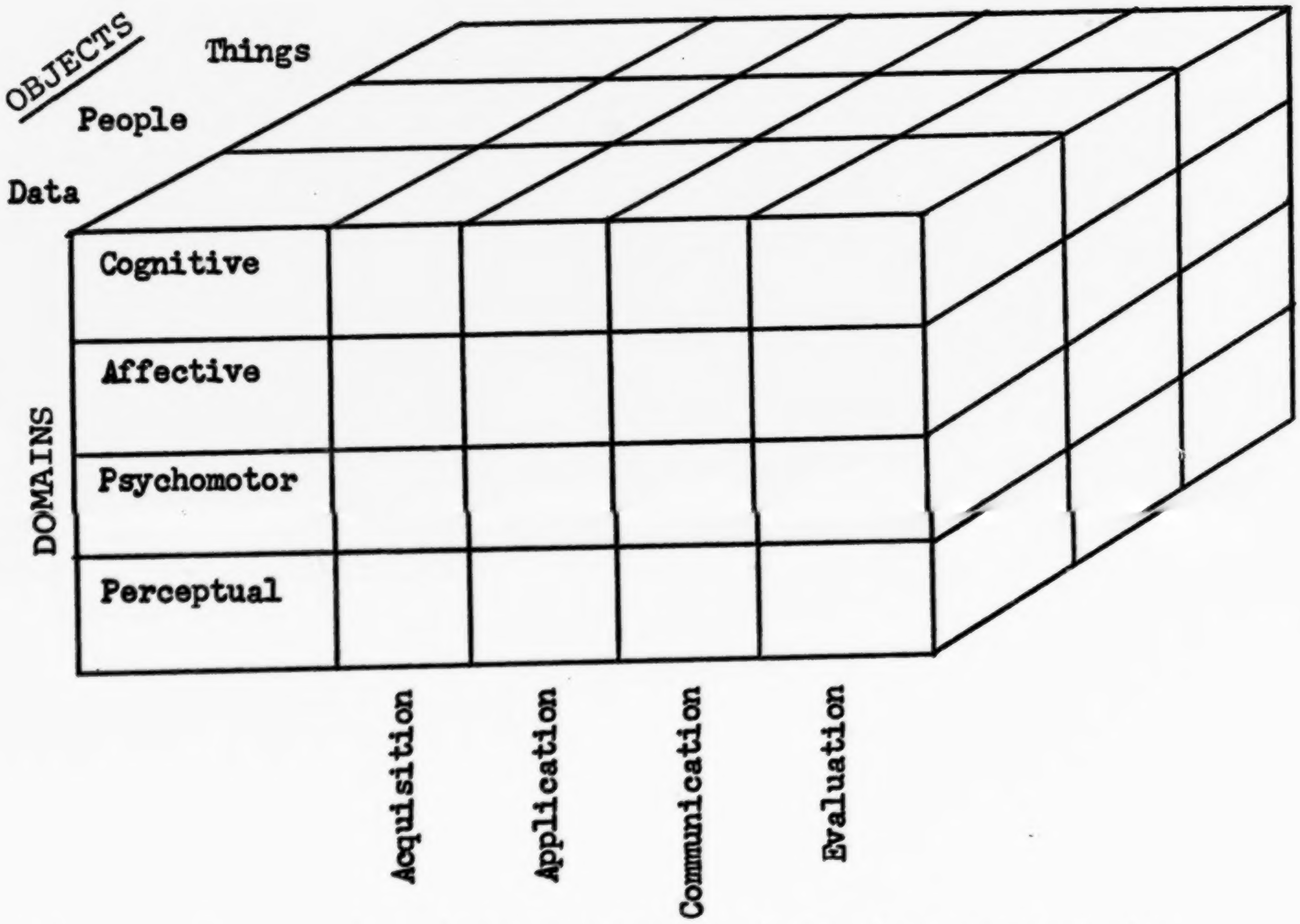
Figure 7

MODEL III

	SYMBOLS	IDEAS	THINGS	PEOPLE	SELF
Sensing Attention Span Acuity Scan					
Recalling Recording (encoding) Storing Remembering (decoding)					
Processing Associating Conceptualizing Organizing					
Responding Manipulating Communicating					

Figure 8

MODEL IV
(our most recent attempt)


OBJECTS
Things
People
Data
Cognitive
Affective
Psychomotor
Perceptual
DOMAINS
Acquisition
Application
Communication
Evaluation

Step 1. analyze a terminal objective into its components

Step 2. classify each component in one of the above 48 cells

APPENDIX A

A

abolish
absorb
abstract
accelerate
accent
accept
accommodate
accompany
accomplish
account
accumulate
acknowledge
acquaint
act
activate
adapt
add
address
adhere
adjust
administer
admit
adopt
advance
advise
affect
affirm
aggregate
aggress
agree
argue
aim
allocate
allow
alter
alternate
amend
amplify
analyze
animate
announce
answer
anticipate
appear
apply
appoint
appreciate
approach
approve
arbitrate
arm
arrange
arrest
arrive
articulate
ascend
ask
aspire
assemble
assent
assert
assign
assimilate
assist
associate
assume
attach
attain
attempt
attract
author
automate
avert
avoid
awake

B

back
balance
ban
band
bank
bar
base
beam
bear
begin
behave
believe
bend
benefit
best
bet
better
bid
bill
blame
board
bond
book
bound
brake
break
breed
bridge
brief
bundle
bump
buy

C

calculate
call
cancel
can

capitalize
care
carry
catch
cause
cease
censor
change
check
choose
circulate
cite
claim
classify
clear
cognate
collaborate
collect
combine
command
commence
comment
commit
commission
communicate
commute
compare
compensate
compete
complement
comply
compose
conceive
conclude
condense
condemn
conduct
confide
confirm
conform
connect
connote
conserve
consider
construct
consume
contact
contemplate
continue
contest
contract
contrast
convene
converse
convert
convey
cooperate
copy
correct
correspond
cost
counsel
couple
cover
create
credit
critique
cue
culminate
curb

D

debate
debit
decelerate
decide
declare
decode
decrease
deduct
defeat
defend
defer
define
delete
delineate
deliver
demand
demonstrate
deny
denote
depart
deplete
deposit
depreciate
depress
derive
descend
describe
design
designate
desire
destroy
detail
detect
determine
develop
devise
diagnose
dictate
differ
differentiate
diffuse
diminish
direct
disagree
disappear
discard
discern
discharge
discipline
disclose
discontinue
discourage
discover

discuss
disguise
disjoin
dismiss
dispense
disperse
displace
dispose
disprove
display
disrupt
dissent
dissolve
distinguish
distort
disturb
diverge
divert
divide
domineer
dominate
dress
drive
duplicate

E

earn
educate
effect
elaborate
elect
elevate
elude
emanate
emerge
emit
employ
enact
encounter
enclose
encourage
end
endow
engage
enjoy
enlighten
enrich
entertain
enter
enunciate
equate
erase
erect
err
erupt
escalate
escape
espouse
establish
estimate
evade
even
exact
examine
exceed
excite
exclude
excuse
execute
exercise
exhaust
exhibit
exist
exit
expand
expect
expedite
expend
experience
experiment
explain
explore
export
express
extend
extract

F

face
factor
fail
familiarize
fatigue
fashion
fasten
fault
feedback
feel
fend
figure
file
finance
find
finger
finish
firm
fit
fix
flex
flee
focus
follow
foot
force
forget
form
formalize
formulate
forward
free
frequent
function

G

gain
gamble
gauge
generalize
gesture
get
give
go
govern
grab
grade
grant
graph
gratify
group
grow
guess
guide

H

hamper
handle
happen
hasten
head
help
hide
hinder
hit
hold
humanize
humor
hunt

I

idealize
identify
illuminate
illustrate
imagine
imitate
impair
impede
imply
impose
impregnate
impress
imprint
improve
incapacitate
incite
include
increase
incur
indicate
induce
indulge
infect
inform
inhabit
inquire
inhibit
initiate
inject
inscribe
insert
inspire
install
institute
intend
interact
interest
interfere
internalize
interpret
interrogate
interview
intervene
intuit
invent
invest
irradiate
irritate
issue

J

join
judge

K

keep
key
knock

L

label
labor
lack
laminate
land
last
laud
lay
lead
leave
lessen
let
level
liberate
lie
lift
light
like
limit
line
liquify
list
litigate
live
load
locate
loom
lose
lower

lubricant

M

machine
magnify
make
manage
manifest
manipulate
man
manufacture
market
mass
master
match
mature
maximize
mean
measure
mediate
meditate
meet
memorize
meter
mimic
minimize
miss
mistake
mix
model
moderate
modify
modulate
mold
mollify
motivate
motor
mount
move
multiply
mutate

N

name
naturalize
navigate
near
need
negate
neglect
negotiate
nominate
normalize
note
notice
nullify
number
numerate

O

obey
object
obligate
observe
obtain
occupy
occur
offend
offer
omit
open
operate
oppose
order
organize
originate
oust
outline

P

pace
pack
package
paint
pair
parallel
part
participate
pass
pattern
pause
pay
penalize
perfect
perform
permeate
permit
persist
persuade
pertain
phase
phrase
pick
picture
piece
pile
pilot
pitch
place
plan
play
please
plot
ply
point
ponder
pool
popularize
populate
pore
pose
possess
post
pour

power
practice
precede
precipitate
predicate
prefer
prepare
present
prescribe
present
press
presume
pretend
prevent
preview
prevent
print
process
procure
produce
profit
program
progress
project
promote
prove
propose
propel
protect
protest
prove
provide
provoke
pull
punish
purchase
propose

Q

qualify
quantify
question
quiet
quit
quote

R

radiate
raise
range
rank
rate
rationalize
reach
react
read
reason
recall
recede
receive
recess
reciprocate
recite
record
recover
rectify
reduce
refer
reflect
register
regress
regulate
reiterate
relay
relieve
rely
remember
remit
remove
renew
repair
repeat
replace
report
represent
reproduce
request
reserve
reside
resign
resolve
respect
rest
restore
retire
retrieve
return
reveal
reverse
review
ride
rise
rule

S

save
say
scale
score
screen
search
see
select
sell
send
sense
sensitize
sentence
separate
service
set
settle
sight
sign
size
sort
space

speak
specify
spread
stabilize
staff
stand
start
state
station
step
stop
store
straighten
strain
stratify
stress
strive
strike
study
subject
submit
subscribe
succeed
sum
supervise
supply
survive
suspect
suspend
sustain
switch
sympathize

T

take
talk
taste
tell
tend
terminate
testify
theorize
throw
time
tire
tolerate
toss
total
touch
trace
transmit
train
transcribe
transfer
transform
translate
treat
trim
try
turn
type

U

undertake
unite
use

V

value
validate
venture
view
violate
visualize
vocalize
voice
volunteer

W

wait
waste
watch
weigh
write

Y

yield

APPENDIX B

PERCEPTUAL

acquire
approach
attend
collect
compare
contact
contrast
detect
differentiate
discriminate
distinguish
estimate
examine
feel
focus
hear
identify
indicate
label
listen
locate
look
match
measure
name
notice
observe
picture
receive
register
scan
search
smell
see
self-perception
sense
touch
watch

THINKING

abstract
analyze
assess
assimilate
associate
believe
change
classify
coding
cognate
compare
comprehend
compose
conceive
conceptualize
conclude
consider
construct
contemplate
create

decide
define
derive
design
develop
determine
diagnose
differentiate
discover
establish
evaluate
factor
figure
forget
formulate
generalize
idealize
imagine
infer
internalize

interpret
intuit
invent
judge
meditate
memorize
modify
order
organize
originate
outline
plan
possess
predicate
process
produce
project
quantify
rank
rate

reason
recall
reflect
remember
retrieve
review
self-concept
sort
solve
store
structure
synthesize
theorize
translate
value
validate
verify
visualize
weigh
trouble shoot

COMPUTATIONAL

abstract
add
analyze
ascend
balance
bill
budget
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INTERACTIONAL

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depress
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fatigue
feel
help
imitate
improve
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initiate
institute
interact
interfere
interrogate
interview
join

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persuade
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prevent
program
promote
purchase
react
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reciprocate
reduce

register

represent

resolve

respond

search

sell

select

serve

service

stop

supervise

supply

teach

terminate

tolerate

train

transform

unite

use

COMMUNICATION

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articulate
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buy
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communicate
connote
contact
correct
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interrogate
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question
recite
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refer
regulate
reiterate
relay
repeat
report
reveal
review
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score
sell
send
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speak
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specify
state
talk
tell
transmit
transcribe
transfer
translate
vocalize
voice
write

MANIPULATION (mechanical)

accelerate
act(ivate)
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adjust
allocate
arrange
arrest
ascend
assemble
assign
attack
automate
begin
bend
break
brake
carry
cause
change
collect
combine
commute
condense
connect
construct
consume
continue
contract
copy
correct
decelerate
decrease
deliver
depart
deplete
descend
direct
displace
drive
elevate
enclose
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erase
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exhaust
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experiment
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grasp
guide
handle
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hold
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insert
install
issue
label
lessen
lift
list
load
lower
lubricate
make
manipulate
manufacture
mechanize
model
moderate
modify
mold
move
number
obtain
operate
order
outline
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pattern
place
power
practice

prepare
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scale
score
select
send
service
set
sort
stop
store
straighten
supply
terminate
time
trace
transfer
transform
turn
type
use
weigh

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ABILITY GROUPING

An examination of the literature on ability grouping, homogeneous grouping, "tracking," streaming" etc. was undertaken. All journal articles and books dealing in any way with the above topics from 1950 to the present time were collected and examined. Those articles or books involving experimental data based on a comparison of some sort of ability group with a heterogeneous, random or control group were taken to be especially important. Articles of this sort totalled 18. The number of articles, books, etc. labeled as discursive (containing opinion or description of a certain system in operation, not involving experimental data collected and analyzed by the particular author) was 41.

For each experimental study comparing homogeneous vs. heterogeneous grouping in some way the following variables or factors were isolated: grade level, sample size, sample range and level, type of grouping (manipulated by experimenter or ex post facto), criterion used for grouping students, cut-offs and weighting for these criteria, diversity of homogeneous and heterogeneous groups, dependent measures, and outcomes.

The discursive studies were quickly perused to obtain new ideas for grouping systems and descriptions of some already in existence but were not systematically reviewed and are not reported on here. The 18 studies are summarized in Table 1.

A REVIEW OF THE STUDIES GROUPED BY OUTCOME AND STUDENT

I. Studies Finding No Differences Between Homogeneous and Heterogeneous Grouping

a. for all pupils

Bicak's study used the 1960-61 8th grade class at the University of Minnesota High School

Table 1

A SUMMARY OF THE GROUPING STUDIES

AUTHOR: Abramson, David A. YEAR: 1959

GRADE LEVEL:	High School
STUDENT INFORMATION:	New York City academic high school (high ability)
GENERAL GROUPING SPECIFICATIONS:	Homogeneous versus heterogeneous versus special school (on IQ)
SPECIFIC GROUPING SPECIFICATIONS:	Homogeneous: IQ ≥ 115 and special range = 115-60 Heterogeneous: all IQ levels Study concentrated on high ability students
SUBJECT SPECIFICATIONS:	Student grouping ex post facto (done by schools)
ACHIEVEMENT FINDINGS:	1. grouping has no effect on GPA in 1st year college 2. grouping has no effect on grades in specific courses
OTHER FINDINGS:	1. women achieve more than men

AUTHOR: Baiow, Irving H. YEAR: 1963

GRADE LEVEL:	Elementary School
STUDENT INFORMATION:	6th grade in four California schools; in first five grades - heterogeneous grouping
GENERAL GROUPING SPECIFICATIONS:	Homogeneous versus heterogeneous versus clustering (high-average versus low-average) on achievement test, IQ, and teacher estimation

Baiow, Irving H. (continued)

SPECIFIC GROUPING SPECIFICATIONS:	Homogeneous on achievement test Cluster on IQ and estimate of emotional stability Heterogeneous - random IQ range: Low: 54-98; Mid: 99-110; High: 111-158
SUBJECT SPECIFICATIONS:	Student grouping ex post facto (done by schools)
ACHIEVEMENT FINDINGS:	1. Cluster group had highest growth in general ability - homogeneous next, then heterogeneous (trend) 2. Growth is inversely proportional to rank in the beginning
OTHER FINDINGS	-

AUTHOR: Bicak, Laddie J. YEAR: 1964

GRADE LEVEL: Junior High School

STUDENT INFORMATION: University of Minnesota 8th grade (science course)

GENERAL GROUPING SPECIFICATIONS:	Homogeneous versus heterogeneous (on IQ)
SPECIFIC GROUPING SPECIFICATIONS:	Median IQ = 117 in homogeneous population Heterogeneous - random group High homogeneous $\geq$ 117 Low homogeneous $\leq$ 117
SUBJECT SPECIFICATIONS:	Grouping manipulated by experimentor two sections randomly chosen for homogeneous grouping
ACHIEVEMENT FINDINGS:	1. no achievement difference between homogeneous and heterogeneous
OTHER FINDINGS:	1. low homogeneous often discontented with placement 2. low heterogeneous often had to neglect other courses for this science course

AUTHOR: Borg, Walter R. YEAR: 1965

GRADE LEVEL: Elementary, Junior High School, and High School

STUDENT INFORMATION: Two adjacent and comparable high school districts (similar in IQ and SES)

GENERAL GROUPING SPECIFICATIONS: Heterogeneous(R) versus homogeneous(A) (on California Achievement Test)

SPECIFIC GROUPING SPECIFICATIONS: Grouping depends on score on California Achievement Test; lowest 20 = low, highest 30 = high, rest = middle

SUBJECT SPECIFICATIONS: Grouping ex post facto

ACHIEVEMENT FINDINGS:

1. no difference in ability gains in homogeneous or heterogeneous in elementary school; tendency to favor homogeneous for high ability group and heterogeneous for low ability group.
2. Some trend in junior high school and high school

OTHER FINDINGS:

1. Better study habits in heterogeneous (elementary)
2. No effect on social adjustment
3. More pupil problems in heterogeneous group
4. Heterogeneous had more favorable self-concept
5. Homogeneous had less sense of belonging

AUTHOR: Borg, W. and Prpich, T. YEAR: 1966

GRADE LEVEL: High School

STUDENT INFORMATION: 10th grade English classes

GENERAL GROUPING SPECIFICATIONS: Homogeneous (low) versus heterogeneous (on English achievement test and IQ and grade placement)

Borg, W. and Prpich, T. (continued)

SPECIFIC GROUPING SPECIFICATIONS:	70-90 IQ ≤ 8.2 gr. low homogeneous group and heterogeneous (from same population) - concentrated on low ability students
SUBJECT SPECIFICATIONS:	grouping manipulated (randomly to homogeneous or heterogeneous
ACHIEVEMENT FINDINGS:	1. no difference in English achievement 2. homogeneous did better on STEP in second year
OTHER FINDINGS:	1. homogeneous did better on teacher estimate 2. no difference in study method and attitudes 3. homogeneous participated more and better quality 4. homogeneous had more favorable attitude toward English 5. homogeneous had better self-concept

AUTHOR: Cawelti, Gordon YEAR: 1963

GRADE LEVEL:	High School
STUDENT INFORMATION:	42 North Central High School with three ability levels in 9th and 10th grade English and math
GENERAL GROUPING SPECIFICATIONS:	Homogeneous grouping - three levels (on IQ, achievement test, and teacher's marks)
SPECIFIC GROUPING SPECIFICATIONS:	-
SUBJECT SPECIFICATION:	Grouping ex post facto on three ability levels
ACHIEVEMENT FINDINGS:	-

Cawelti, Gordon (continued)

OTHER FINDINGS:
1. mean class size greater for higher group
2. teachers did not feel bad social attitudes resulted
3. 88% principals liked it and felt greater achievement
4. high group teachers better prepared

AUTHOR: Cochran, John R. YEAR: 1961

GRADE LEVEL: Junior High School

STUDENT INFORMATION: flexible grouping in Kalamazoo
10% school chosen for experimental group randomly

GENERAL GROUPING SPECIFICATIONS: Heterogeneous versus flexible grouping (on IQ, achievement test, teacher estimate)

SPECIFIC GROUPING SPECIFICATIONS: Students in two groups paired on sex, age, 6th grade achievement and intelligence

SUBJECT SPECIFICATIONS: Grouping manipulated 10% - homogeneous
rest - heterogeneous
matched groups

ACHIEVEMENT FINDINGS:
1. no significant difference in achievement found

OTHER FINDINGS:
1. 77% teachers were satisfied
2. 71% parents said students interest was greater
3. 65% upward mobility

AUTHOR: Dyson, Ernest YEAR: 1967

GRADE LEVEL: Junior High School

STUDENT INFORMATION: Two 7th grade populations equal in age, achievement, IQ, SES, and school - only difference is in grouping method

Dyson, Ernest (continued)

GENERAL GROUPING SPECIFICATIONS:	Homogeneous (244) versus heterogeneous (323) (on IQ, achievement, teacher estimate, and principal)
SPECIFIC GROUPING SPECIFICATIONS:	Students in different grouping methods comparable - number of groups unknown
SUBJECT SPECIFICATIONS:	Grouping ex post facto
ACHIEVEMENT FINDINGS:	-
OTHER FINDINGS:	self concept: 1. no sex difference 2. grouping did not affect self-concept or self-acceptance 3. academic self-concept predictive of school success 4. academic self-concept dependent on assigned group

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AUTHOR: Goldberg, Miriam et al. YEAR: 1961

GRADE LEVEL: Elementary School

STUDENT INFORMATION: 2,219 students from 45 elementary schools

GENERAL GROUPING SPECIFICATIONS:	Homogeneous (on IQ) versus heterogeneous
SPECIFIC GROUPING SPECIFICATIONS:	A = more than 130 B = 120-29 C = 110-19 D = 100-09 E = less than 99
SUBJECT SPECIFICATIONS:	Grouping manipulated - organized to represent all combinations of ability levels

Goldberg, Miriam, et al. (continued)

ACHIEVEMENT FINDINGS:	1. grouping had no effect on achievement 2. value of grouping depends on way it is used; effect is neutral
OTHER FINDINGS:	1. Interest increases with grouping 2. Self-attitude effected by grouping 3. Attitudes towards others and the school not effected 4. Teacher appraisal not effected by grouping

AUTHOR: Howell, Wallace J. YEAR: 1962

GRADE LEVEL:	High School (880 students)
STUDENT INFORMATION:	Middle SES; residential suburban community (Penfield - Rochester, N.Y.)
GENERAL GROUPING SPECIFICATIONS:	Homogeneous (high) on IQ, achievement, teacher, counselor estimate, parental permission versus heterogeneous Homogeneous (honors) and heterogeneous (high) comparable in IQ, mean & range
SPECIFIC GROUPING SPECIFICATIONS:	Concentrated on honors (high ability) students
SUBJECT SPECIFICATIONS:	Median IQ = 114 for population 3/4 continued after high school grouping manipulated
ACHIEVEMENT FINDINGS:	1. high homogeneous had more achievement than in heterogeneous
OTHER FINDINGS:	1. grouping did not lead to bad social character 2. grouping did lead to a more realistic view of ability

AUTHOR: Klausmeier, H.J. et al.   YEAR: 1960

GRADE LEVEL:	High School
STUDENT INFORMATION:	Three comprehensive high schools - all used some ability grouping - comparable GPA in three school samples
GENERAL GROUPING SPECIFICATIONS:	Homogeneous grouping evaluated M grouped on IQ and teacher estimate L grouped on achievement and teacher estimate S grouped on teacher estimate, reading test, and IQ
SPECIFIC GROUPING SPECIFICATIONS:	population comparable in GPA across schools
SUBJECT SPECIFICATIONS:	Grouping ex post facto
ACHIEVEMENT FINDINGS:	-
OTHER FINDINGS:	1. most students favored grouping (high - most; middle - least) 2. high group more often chose friends within class; low group chose friends within neighborhood 3. school or community size unrelated to students attitude towards grouping

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AUTHOR: Lovell, John R.   YEAR: 1960

GRADE LEVEL:	High School (Bay High School, Panama City Florida)
STUDENT INFORMATION:	sophomores ability grouped
GENERAL GROUPING SPECIFICATIONS:	Homogeneous versus heterogeneous odd numbered students placed in experimental group to lessen individual difference range - others placed to increase individual difference (250 students in each)

Lovell, John R. (continued)

SPECIFIC GROUPING SPECIFICATIONS:	Experimental group; top 30 - one class next 30 - next class - control group - balance of high, medium, and lows
SUBJECT SPECIFICATIONS:	Grouping manipulated
ACHIEVEMENT FINDINGS:	1. homogeneous made greater achievement in English (upper 1/3 most gains lowest - not significant) 2. no difference in biology and math (trends favored experimental)
OTHER FINDINGS:	1. no difference in self-acceptance and acceptance of others 2. significant difference more favorable student and teacher attitudes in experimental group towards subject and class

AUTHOR: Marklund, Sixten YEAR: 1963

GRADE LEVEL:	Elementary School
STUDENT INFORMATION:	6th grade (teacher and class factors controlled) by sub-population examination)
GENERAL GROUPING SPECIFICATIONS:	Homogeneous versus heterogeneous (on IQ)
SPECIFIC GROUPING SPECIFICATIONS:	Extraneous variables controlled Only homogeneity and class size were independent
SUBJECT SPECIFICATIONS:	Grouping ex post facto
ACHIEVEMENT FINDINGS:	Homogeneous grouping has no effect on high or low achievement classes
OTHER FINDINGS:	1. Crux is teacher's method and pupil's habits and extent to which homogeneous affects pupil's activity & reinforcement

AUTHOR: Millman, Jason YEAR: 1964

GRADE LEVEL: Junior High School

STUDENT INFORMATION: New York State Education System 48 school systems - Iowa Test of Basic Skills used

GENERAL GROUPING SPECIFICATIONS: Homogeneous versus heterogeneous (on initial achievement level ITBL on English and math)

SPECIFIC GROUPING SPECIFICATIONS:

		English		Math
Gr.7	H	84.3	H	78.5
	M	75.5-84.2	M	74.8
	L	75.5	L	73.9
Gr.8	H	91.8	H	85.8
	M	84-91	M	79.3-85
	L	83.9	L	79.3

SUBJECT SPECIFICATIONS: Grouping manipulated by ITBL pre and post test scores - then it was examined which students were taught in same sections

ACHIEVEMENT FINDINGS:

1. no relation in either English or math between gains and section variability (ability grouping did not effect achievement)

OTHER FINDINGS: -

AUTHOR: Pattinson, William YEAR: 1963

GRADE LEVEL: High School

STUDENT INFORMATION: 120 students in technical high school (England) pupils very close in ability levels

GENERAL GROUPING SPECIFICATIONS: Homogeneous versus heterogeneous (experimental = heterogeneous) (random)

SPECIFIC GROUPING SPECIFICATIONS: Order of Merit Scores; range 87-596 less difference between marks - no grading of experimental group

Pattinson, William (continued)

SUBJECT SPECIFICATIONS:	Grouping manipulated (experimental or randomly grouped to achieve full spread of ability) - compared to itself when homogeneous grouping was used
ACHIEVEMENT FINDINGS:	-
OTHER FINDINGS:	1. greater student behavior and attitude in heterogeneous group 2. less drop out rate 3. class performance increased

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AUTHOR: Peterson, Richard L. YEAR: 1967

GRADE LEVEL: Junior High School

STUDENT INFORMATION: 317 7th & 8th grade students

GENERAL GROUPING SPECIFICATIONS:	Homogeneous versus heterogeneous (standard tests in language and math)
SPECIFIC GROUPING SPECIFICATIONS:	Homogeneous and heterogeneous matched for achievement
SUBJECT SPECIFICATIONS:	Grouping manipulated - comparable ability groups assigned to homogeneous or heterogeneous conditions
ACHIEVEMENT FINDINGS:	1. 8/27 post achievement tests favored heterogeneous
OTHER FINDINGS:	1. majorities of students and teachers favored ability grouping 2. all teachers wanted high sections (only 50% wanted low sections)

AUTHOR: Pfeiffer, Isobel YEAR: 1967

GRADE LEVEL:	High School
STUDENT INFORMATION:	Large suburban school
GENERAL GROUPING SPECIFICATIONS:	Homogeneous (high) on IQ, grade level, marks and achievement test versus homo (low)
SPECIFIC GROUPING SPECIFICATIONS:	Enriched = IQ ≥ 130 Average = rest Adjusted = below average English marks and two grade levels below on achievement test
SUBJECT SPECIFICATIONS:	Grouping ex post facto for three levels
ACHIEVEMENT FINDINGS:	1. no difference in achievement between high and low ability groups
OTHER FINDINGS:	1. no difference in teacher - student interaction between groups 2. 3/4 teachers of low groups expected little progress 3. teachers in high groups emphasized content more

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AUTHOR: Zweibelson, I. et al. YEAR: 1966

GRADE LEVEL:	Junior High School
STUDENT INFORMATION:	New Rochelle school - 20% Negro sample; mean IQ = 112; same number each sex
GENERAL GROUPING SPECIFICATIONS:	Homogeneous versus heterogeneous (team taught) (on group IQ reading and math test and teacher estimate)
SPECIFIC GROUPING SPECIFICATIONS:	Four homogeneous groups (cut-offs unknown) - equivalent sample team-taught
SUBJECT SPECIFICATIONS:	Grouping manipulated (1/4 highs in each of four quarters) control group matched to experimental group

Zweibelson, I. (continued)

ACHIEVEMENT FINDINGS:	1. team-taught heterogeneous group achieved as well as homogeneous
OTHER FINDINGS:	1. heterogeneous group had better attitude towards other students with different SES 2. teachers favored team-teaching 3. team-taught lower 1/4 students participated more in discussion than equivalent homogeneous group

to examine the effects of homogeneous and heterogeneous grouping on the achievement and attitudes of students. Each student was randomly assigned to one of three heterogeneous sections maintained during the fall quarter. After that two sections were transformed into homogeneous ones on the basis of IQ and the other was left intact as a control group. No difference in mean achievement gains in meterological knowledge was found between the homogeneous and heterogeneous conditions. It was found on a course attitude questionnaire that the low homogeneous group was significantly more discontented with their placement than were other homogeneous groups or heterogeneous groups. Also the low heterogeneous group stated that they often were forced to neglect their other courses for this one in science.

Borg examined differences between homogeneous and heterogeneous grouping on achievement, study habits and methods, social adjustment and pupil peer status and the self-concept and other personality areas. He used two comparable school districts in Utah, one of which employed random grouping (District R), and the other - ability grouping. (District A). Data was collected over a four year period in order to appraise the long term effects of the grouping treatments. Ability grouping in District A was done on the basis of a composite achievement test score (CAT), and three levels were set up (superior, average, and slow). There was found to be no significance between homogeneous and heterogeneous groups (11 levels) on achievement, as measured by the sequential tests of Educational Progress (STEP). There was, however, a tendency for homogeneous grouping to result in greater achievement gains for superior students and random or heterogeneous grouping to result in greater achievement for slow pupils. The ability differences for average pupils did not favor either grouping treatment. On non-achievement measures the heterogeneous group (on the elementary school level) was found to have better study habits. No differences were found between groups in social adjustment. More pupil problems were found to result in the heterogeneous groups. The heterogeneous grouping treatment seemed to result in a more favorable self-concept being held by the students. The homogeneous groups expressed less of a general sense of belonging than did heterogeneous groups.

Cochran examined the program of "flexible grouping" used in junior high schools in Kalamazoo, Michigan. The criterion used for grouping were intelligence test scores, achievement test scores and teacher's estimates of interest, motivation and need. 10% of the student population was randomly assigned to the homogeneous condition (experimental group). Matched students were selected to serve as a control group. Through questionnaires submitted to teachers, it was found that 77% of the teachers were satisfied with the flexible grouping system. There was general agreement that grouping did little to improve the behavior of students or to improve their attitudes towards each other. Changes in teaching method were found in teachers of either high or low groups, but not in the average ones. 1% of the parents reported an increase of interest in school among students grouped homogeneously. There was found to be 65% upward mobility among students in moving from one homogeneous group to another. No differences in achievement as measured by achievement tests at the end of the 8th grade were found between students grouped homogeneously and those grouped hetereogeneously.

Dyson chose two seventh grade populations, comparable with respect to age, intelligence, academic achievement, school grades, school environment and the socioeconomic level of the community. Using the Index of Adjustment and Values (IAV) and the Word Rating List (WRL) Dyson examined possible differences in self-acceptance and academic self-concept between students grouped homogeneously and those grouped hetereogeneously. The homogeneous grouping was accomplished using the following criterion: IQ, achievement, and teacher and principal's evaluation. It was found that grouping did not affect the academic self-concept or self-acceptance. The academic self-concept was shown to be realistically predictive of school success, and also often depended on which group level the student was assigned to.

Goldberg examined the effects of the level and range of grouping on elementary school students. She used as her sample 2,219 students from 45 elementary schools. The homogeneous grouping was done soley on the basis of IQ, and five groups were assigned, each having a range of 10 IQ points. These five groups were then organized in all ways possible (15 combinations) to represent all combinations of ability levels. Grouping was found to have no effect on achievement. Student interest increased with homogeneous grouping. Grouping did not affect students' attitudes towards other and the school. Teachers' appraisals of students were also not affected by grouping.

Sixten Marklund studied achievement gains as related to the size and homogeneity of class in grade 6. Homogeneity was defined by IQ variability on conventional tests. An extremely large sample of more than 4,000 students was used and in order to control for extraneous variables, controlled sub-populations measures were statistically obtained and used. It was found that homogeneous grouping had no effect on achievement in either high or low achieving classes. Marklund inferred that the most important determinant of achievement is the extent to which size and homogeneity of class affects pupil activity and reinforcement (which in turn, according to him, affect the learning process). This means that the teacher's instruction method and the pupil's method of study determine the amount of achievement gains in a given class of students.

Millman and Johnson examined the relationship between achievement gains and section variability (amount of homogeneity in the classroom) on the junior high school level using 48 representative New York State school systems. Grouping was done by the experimenters on the basis of initial achievement level in English and mathematics. The standard deviation on the initial achievement measures served as the measure of class variability and the mean score on the same measure served as the measure of level. No increase in achievement resulted from a decrease in variability (homogeneous grouping) in general. Specifically, a narrow range (homogeneous grouping) may have been of some value to high level sections in mathematics. However, no clear-cut relation between homogeneity and achievement gains was found.

Isobel Pfeiffer examined verbal interaction and cognitive goals of teachers in 11th grade, ability grouped English classes in a large suburban high school. The Flanders Interaction Analysis was completed for two ability level classes for each of five teachers to measure and evaluate teacher-pupil verbal interaction. Bloom's Taxonomy of Educational Objectives: Cognitive Domain was used to analyze cognitive goals of test items from two tests from each class. Categories of analysis were: knowledge, comprehension, application, analysis, synthesis, and evaluation. Three ability levels, formed on the criterion of IQ, grade level and achievement, were used in the system studied. The findings showed no difference in achievement between high and low ability groups. Also no difference in teacher-student interaction was observed at different ability levels. Three-fourths of the teachers of the low group said that they expected little progress from their students. The teachers of the high ability groups were found to emphasize content more. Pfeiffer suggested that the lack of differential achievement between different ability levels may be the result of the lack of differentiated teacher behavior between groups.

Zweibelson, et al. examined the difference between heterogeneous grouping, homogeneous grouping, and team-teaching as manifested in student achievement gains and student and teacher attitudes. He used as his sample a New Rochelle New York junior high school with 1,800 students. Classes were ability grouped using IQ, reading and math test scores, and teacher estimate as criterion, and arranged so that approximately one-fourth of the high-ability students were in the upper quarter, one-fourth in the lower quarter, etc. 100 students at each grade level with one class from each of the four quarters were selected at random to be the experimental (team-taught) students. A matched group of the same size and composition was used as a control measure. It was found that the team-taught heterogeneous group achieved just as well as the homogeneous group (which had not been team-taught) on social studies achievement tests. Students in the heterogeneous sections were found to have better (more tolerant) attitudes toward other students from different socioeconomic backgrounds. The teachers favored team-teaching. The team-taught low-group students (lower one-fourth in ability) were found to have participated more in the class discussion than when grouped homogeneously and taught by traditional methods.

b. for high ability pupils

Abramson studied the effectiveness of ability grouping for high ability students on the high school level. Effectiveness was taken to be measured by the subsequent progress in college of these students. Four types of grouping done by 154 New York City academic high schools were studied: heterogeneous (controls) grouping, homogeneous in one or two major subjects, homogeneous in most major subjects, and homogeneous throughout the school (only high ability students were admitted to the school). The populations of the different schools as far as the high ability students went was examined and found to be comparable on IQ, sex, and number of students in each level of intelligence. The major finding was that the type of grouping used or extent of it had no effect on the grade point average (GPA) in the first two years of college. Also grouping had no effect on achievement in specific college courses. Finally, women were shown to obtain higher GPA's on the average than the men in the sample.

II. Homogeneous groups better than heterogeneous

a. for all pupils

Baiow examined the effects of homogeneous, heterogeneous and cluster (high + average and low + average) grouping on the achievement at the elementary school level. The sixth grades of four southern California elementary schools were used as the sample. Homogeneous grouping was done using as a criteria the results of an achievement testing program, and four groups were formed. Clustering was done on the basis of IQ and teacher estimate of emotional stability. The Metropolitan Achievement Test was used to measure achievement gains at the end of one school year. The trend of the results was that the cluster groups had the highest growth in general ability, the homogeneous groups achieved on the second highest level and the heterogeneous had the lowest achievement score. Also it was found that the achievement gain of a student or a group of students was inversely proportional to the initial rank.

Cawelti studied ability grouping programs in 42 North Central Association high schools in Iowa, Illinois, Minnesota, and Wisconsin. A preliminary survey showed that all of these schools grouped on at least three different ability levels in ninth and tenth grade English and mathematics. Results or descriptive knowledge of grouping practices were obtained through interviews with principals and counselors and teacher questionnaires. Homogeneity was achieved through the criterion of IQ, achievement test scores, and past grades. The results were that mean class size was found to be significantly larger for the higher ability groups. The teachers did not feel that bad social attitudes (i.e., conceit, snobbery and/or prejudice) were a result of grouping practices. 88% of the principals felt that grouping was good and resulted in higher achievement by the students involved. The teachers of the high ability groups felt that they were better prepared in their classes than did those who taught lower-level groups.

Klausmeier asked high school students and teachers in three schools to evaluate the sectioning practices used in their school. The schools were comparable on type of sectioning and the GPA of the students in each of the populations. The results of questionnaires and interviews were that most students favored grouping by ability, with the high level students favoring it most and the middle level students least. The high level students also were proven to choose their friends most often on the basis of those in the same class section as themselves, whereas lower level students were found to choose their friends on the basis of geographical closeness (i.e., same neighborhood). The last finding was that the size of the school or community was unrelated to the attitude of the student towards the practice of grouping.

Lovell evaluated the experimental method of grouping used at Bay High School in Panama City, Florida. The sophomore class was grouped by ability and then odd-numbered students were put into the experimental group (homogeneously grouped to reduce variation in all English, biology and algebra classes) and even-numbered students served as the controls (heterogeneous group). Standardized achievements tests, a sociometric instrument, the Index of Adjustment and Values and a student attitude questionnaire were employed to discover the effects of the grouping on the students. The homogeneously-grouped students were found to have made significantly greater gains in English, with the upper one-third of this group (high-homogeneous) making the greatest gains and the low-homogeneous group taken alone making insignificant achievement gains. No differences in achievement gains were found in either biology or mathematics, but the trends were in favor of the experimental (homogeneous) group. No difference was found between the two groups in measures of self-acceptance or acceptance of others. Student and teacher attitudes towards the class and subject matter were found to be more favorable among those involved in the experimental homogeneous grouping.

b. for high group

Howell studied the effects of grouping on high ability students in Penfield High School. Penfield is a middle-class, completely residential suburb of Rochester. The high school population has a median IQ of 114; 75% of the students continue their education after high school, with 60% entering four year colleges and universities. In this study an experimental 9th grade honors section (high-homogeneous) was chosen using the criterion of IQ, achievement tests, past grades, counselor and psychologist's judgment, teacher judgment and parental permission. Using final grades as a measure it was concluded that the high-homogeneous group achieved higher than those high ability students grouped heterogeneously. Grouping did not seem to have led to the development of any undesirable social characteristics. Also grouping was seen to result in the development of a more realistic view of individual ability of the part of these high-level students.

c. for low group

Borg and Prpich compared the performance of slow learning high school pupils in ability grouped and heterogeneously-grouped English classes. The low homogeneous group (and a comparative random or control group) was made up of those students with an IQ between 70 and 90 and grade placement of 8.2 or lower on English achievement measures. Results were found using the Pintner General Ability Test and the Metropolitan, an English achievement test, both of which were routinely administered near the end of 9th grade to both groups of students. Teacher and pupil attitudes were also examined using standardized surveys, tests, indices and questionnaires. No difference between the two groups was found on measures of English achievement, though the homogeneously-grouped students were found to have higher achievement on the STEP test in the second year. Teachers gave higher estimates of ability to the homogeneous group. No difference was found in study methods or attitudes. The homogeneously-grouped students participated more frequently and on a higher level in class. The homogeneous group had a more favorable attitude towards English, and also more favorable self-concepts.

III. Heterogeneous groups were better than homogeneous

a. for all pupils

Pattinson compared a randomly-grouped school to a streamed school, both of which he had worked in. His experimental group was composed of 120 students in a technical high school in England. These pupils were known to be very close to each other in ability (as measured by their previous scores on the Order of Merit exam). No subject or form lists, or promotions or deductions were done in this school system. He concluded that better student behavior and attitudes were found in a heterogeneously-grouped situation. There was a lower student drop-out rate from this school. Class performance, as a whole, also was found to increase in the random group situation.

Peterson studied the effects of ability grouping on grades 7 and 8 in Chisolm Junior High School, Chisolm, Minnesota. Achievement, student attitudes and teacher attitudes were examined. Homogeneous grouping was accomplished using standardized exam scores in language and mathematics as criterion. In 8 out of 27 post-achievement tests the heterogeneous group was found to do better. The majority of students and teachers favored ability grouping. All of the teachers wanted to teach only high level section, whereas only 50% of the teachers wanted to teach any low ability sections.

IV. Conclusions

A total evaluation of the literature reviewed here has not been made as yet. However, an initial evaluation leads to the conclusion that homogeneous ability grouping provides little if any advantage in school performance. Conclusions are difficult to draw from this data since the studies were done with different age groups, using different grouping criteria, and different outcome measures. A more complete set of conclusions and inferences will be forthcoming in a later report.

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II. PROBLEMS

None to date

III. SIGNIFICANT FINDINGS AND EVENTS

The following chart of data concerning the state-supported curriculum laboratories with which SCOPE will be working was compiled from a questionnaire sent to the director of each laboratory. To our knowledge, it is the first completion of such data.

IV. DISSEMINATION ACTIVITIES

Numerous avenues have been utilized for publicizing the efforts of the SCOPE Project. Descriptive articles have been published in the Newsletter of the Vocational-Technical Education Department at Rutgers University, and in the Fall '68 Research Bulletin of the New Jersey School Development Council. Mr. Casello has authored a general narrative of project activities for the Winter edition of Feedback, the publication of the Occupational Research and Development Branch of the New Jersey State Department of Education.

The SCOPE brochure has been disseminated to approximately 750 educators across the nation, including state directors of vocational education, curriculum lab directors, teacher educators, state and national officials, and professors at various colleges and universities. Many more were distributed at the AVA Convention to people who stopped by the SCOPE suite, and on our travels throughout the nation.

Meetings with various groups have and will continue to give the SCOPE staff an opportunity to publicize our efforts. Dr. Byrl Shoemaker, Commissioner of Vocational Education in the State of Ohio, generously consented to present the SCOPE Project to other state directors of vocational education at their annual meeting at the AVA Convention. Mr. Casello had an opportunity to go before the AVA Agricultural Division Professional Information Committee to present SCOPE to the nation's agricultural educators. Dr. Tuckman has spoken to the faculty of the Vocational-Technical Department at Rutgers and to a group of Rutgers alumni concerning our efforts, while Mr. Casello has carried the program to high school vocational educators in New Jersey. Meetings with university professors and high school representatives such as those mentioned above

	ANNUAL BUDGET	NO. OF EMPLOYEES	SIZE OF FACILITIES (SQ. FEET)	VALUE OF EQUIPMENT
Texas - D.E.	38,000	5	1,134	-
Texas - Ind. & B.E.	240,000	37	4,560	40,000
Texas - Agr.	160,000	24	11,800	24,000
Tennessee	125,000	12	4,500+	125,000
S. Carolina	101,000	11	3,500	62,000
Oregon	24,000	NO LAB	NO LAB	
Ohio - T.&I.	15,000	6	2,800	25,000
Ohio - D.E.	10,000	3	900	20,000
Ohio - Agr.	30,000	6	700	800
N. Carolina	219,000	19	4,000	50,000
New Jersey	40,000	6	1,300	20,000
Missouri	20,000	12	2,600	7,000
Louisiana	100,000	10	8,500	75,000
Kentucky	14,000	11	-	-
Illinois	175,000	31	28,000	-
Georgia	13,500	2	-	-
Alabama	18,000+	4	3,220	40,000

	AREAS OF SPECIALIZATION	Agr.	T. & I.	Bus. & Off.	D.E.	Home Ec.	Health	Technical	Vocational Guid.
Texas - D.E.					X				
Texas - Ind. & B.E.			X						
Texas - Agr.		X							
Tennessee		X	X	X	X	X	X	X	
S. Carolina		X	X	X	X	X	X		X
Oregon		X	X	X	X	X	X		
Ohio - T.&I.			X						
Ohio - D.E.					X				
Ohio - Agr.		X							
N. Carolina		X	X	X	X	X	X	X	
New Jersey		X	X	X	X	X	X	X	X
Missouri		X	X	X	X	X	X	X	
Louisiana		X	X	X	X	X	X	X	X
Kentucky		X	X	X	X	X	X		
Illinois		X							
Georgia			X						
Alabama			X		X		X	X	

	PUBLICATIONS ON FILE	PUBLICATIONS PER YEAR	ANNUAL GROSS RECEIPTS	PUBLICATIONS AVAILABLE TO OTHER STATES
Texas - D.E.	120	13	-	Yes
Texas - Ind. & B.E.	116	-	-	Yes
Texas - Agr.	50	20	15,000	Yes
Tennessee	None	104	None	Yes
S. Carolina	50	50	8,000	Special Printing
Oregon	-	-	-	-
Ohio - T.&I.	250	5	175,000	Yes
Ohio - D.E.	30	6-8	6,000	Yes
Ohio - Agr.	60	5	25,000	Yes
N. Carolina	1,800	50	None	Single copies
New Jersey	175	15-20	17,000	Yes
Missouri	24,000	25,000	21,000	Yes
Louisiana	50	15	4,000	Yes
Kentucky	-	-	-	No
Illinois	350	25	70,000	Yes
Georgia	52	23	Free	Single copies
Alabama	18,638	19,500	-	Yes

VOCATIONAL-TECHNICAL EDUCATION
at Rutgers University
The State University of New Jersey

Vol. III; No. 1 FALL 1968

APPENDIX A

Curriculum R&D Program Underway; Focus on Revolutionary Aims and Objectives

A new research activity has been initiated in the Department of Vocational-Technical Education under the directorship of Dr. Bruce W. Tuckman, Associate Professor of Education, in the Departments of Vocational-Technical Education and Educational Psychology. Funded for two years by a United States Office of Education (USOE) grant in the amount of $136,000—a Study of Curriculums for Occupational Preparation and Education (SCOPE Program) is underway with the primary objective of coordinating and contributing to a national curriculum development effort at the secondary school level. The effort is aimed at increasing the relevance of high school education for the large majority of youth who must seek employment or further job training upon graduation.

Divided into two phases, Phase One has four objectives: (1) to establish communications between state-supported vocational curriculum development centers; (2) to increase the familiarity of the directors of vocational curriculum development centers with recent advances in behavioral approaches to curriculum development, devices, and evaluation; (3) to refine and test a scheme for classifying educational objectives in terms of performance requirements of each objective rather than the subject matter; and, (4) to develop a detailed plan of activity for Phase II of the SCOPE Program, including the identification of staff and facility needs.

Two spring 1969 conferences will be held at Rutgers University to bring together the center directors in the Nation for the purpose of establishing communications and cooperation among them and for the purpose of disseminating information concerning present modernizing trends in the production of curriculum materials.

The aims of SCOPE support those of the Federally-supported Educational Systems Program of the 1970's, which attempts to impact on the high school of the future by providing more closely for individual students, especially those relevant to future employment opportunities.

SCOPE will confront problem areas such as ability grouping and tracking, the status of vocational education offerings, and curriculum evaluation and will focus on the advancement of more rigorous, respectable, and relevant programs of studies for high school students.

SCOPE will anchor educational activities to the specific behavioral goals to provide the basis of a highly individualized and reality oriented curriculum.

The SCOPE Center is housed in the Douglass-Wood Lawn Gatehouse on the Douglass Campus of Rutgers University. Joseph H. Casello is the assistant to the director.

APPENDIX B

The SCOPE Program

Bruce W. Tuckman[1]

SCOPE is an acronym for the Study of Curriculums for Occupational Preparation and Education. Its major objective is to coordinate and contribute to a national curriculum development effort at the secondary school level aimed at increasing the relevance of high school education for the large majority of our youth who must seek employment (or further job training) upon graduation. To serve the needs of these youth, the curriculum of the secondary school will require the inclusion of experiences relevant to future employment needs.

The SCOPE Program has aims which interface with those of a new Federally supported effort known as the Educational Systems of the 70's. (See the article by John Rosser "Willingboro ES '70 Projects" in the Summer 1968 Issue of the Research Bulletin). The ES'70 program is an attempt to make an impact on the high school of the future by more closely providing for individual student needs. Seventeen participating school districts are attempting to develop and implement various aspects of the program such as the integrated curriculum, individualized instruction, etc. The notion of the truly integrated curriculum, i.e., one in which concepts common to different subject matters become the core of a curriculum rather than organizing the curriculum completely around the subject matters themselves, is at the heart of ES '70. It is here that the activities of SCOPE as well as other University projects will contribute to the overall programmatic approach.

Funding has been obtained from the U.S. Office of Education for the first phase of the SCOPE Program, named Project CONECT, another acronym standing for the Coordination of Occupational and Non-occupational Curriculums and Technologies. The objectives of this first phase of the SCOPE Program are as follows:

(1) To establish a functional communication link between the state supported vocational curriculum development centers.

(2) To increase the familiarity of the directors of the above centers with recent advances in behavioral approaches to curriculum development, devices, and evaluation.

(3) To refine and test a scheme for reorganizing educational objectives in terms of the behavioral process used to accomplish each objective and the object of the process in each instance (the process-object model).

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[1] Dr. Tuckman is Associate Professor of Education at Rutgers, holding joint appointments in Educational Psychology and Vocational-Technical Education.

From New Jersey School Development Council, Research Bulletin, Fall 1968 edition, page 16-17.

(4) To develop a detailed plan of activity for Phase *II* of the SCOPE Program including the identification of staff and facility needs.

There are approximately 15 State-supported vocational curriculum development centers throughout the country that have been involved for some time in the development of curriculum materials. These centers could become a significant resource in future attempts to provide greater occupational relevance to secondary education if they were to function in a more coordinated manner, and if they were to become sufficiently cognizant of, and enthusiastic about, present modernizing trends in the production of curricular materials. The first two objectives represent an attempt to accomplish both coordination and stimulation among these centers.

Present plans in the ES '70 program call for an attempt to reorganize the high school curriculum in a direction away from separation of subject matter based on learning objectives. To this end, many subject matter experts may be called upon to identify the educational objectives included in their area of the high school curriculum. Thus, given the "pieces," it will be necessary to put them together in some meaningful way. The process-object model for the integration of objectives is an attempt to structure learning experiences in a manner more consistent with their application to the tasks of life than the present subject matter breakdown. During the first phase of SCOPE, this scheme will be refined, written about, and tested.

If national curriculum reform at the secondary school level is to become a reality, and if this reform is to move the curriculum toward greater relevance for more students, then some central coordination of activities will be required. Planning for the SCOPE Center to participate in the development and coordinating of such national efforts will be undertaken as the final task of the first phase.

The notions of systematic specification of educational goals in behavioral terms, hierarchial analysis of knowledge and competence, contingency management and the like are approaches that behaviorally-oriented psychologists and educators are attempting to introduce into the mainstream of curriculum development. Anchoring educational activities to the specific behavioral goals which they are intended to produce provides the basis for a highly individualized and reality-oriented curriculum. Moreover, it does not, as some have claimed, reduce the ranges of individual differences. By providing slow learners with a more adequate grasp of basic concepts, the behaviorally-structured curriculum increases their potential for unique individual development. Moreover, rapid learners can proceed at their own pace and can go "beyond" the curriculum.

Individualized instruction, the integrated curriculum, the career-oriented curriculum (one which painlessly and respectably exposes more students to skill training and development) may seem like pipe dreams today. The SCOPE Program is an effort to bring them closer to the reality of tomorrow.

APPENDIX C

Hidden among the stately oak, elm, and maple trees in a corner of the Neilson Campus of Douglass College is a weatherbeaten white gatehouse. Known to the small handful of local residents who are aware of its existence as the "Woodlawn Gatehouse," it has the tired look of a structure whose useful and productive period has long since passed. The outside belies the interior, however, for inside a small revolution in the field of education is brewing. This is the home of the SCOPE Project.

SCOPE is an acronym for the Study of Curriculums for Occupational Preparation and Education. Under the able leadership of Dr. Bruce Tuckman, Associate Professor of Education at Rutgers, the project seeks to coordinate and contribute to a new and exciting national curriculum development effort at the secondary school level. Top priority at the SCOPE Center will be given to the urgent need to include experiences relevant to future employment needs of the large majority of our youth who must seek employment or further training upon graduation or withdrawal from high school. SCOPE's contribution toward making high school a more meaningful experience will include:

1. establishing a functional communication network among the various state-supported vocational curriculum development centers;

2. increasing the familiarity of the directors of the above centers with recent advances in behavioral approaches to curriculum development, devices, and evaluation, and;

3. refining and testing a scheme for reorganizing educational objectives in terms of the behavioral process used to accomplish each objective and the object of the process in each instance (the process-object model).

There are approximately fifteen state-supported vocational curriculum centers throughout the country that have been involved in the development of curriculum materials. The Federal Government has authorized funds for the SCOPE endeavor because it believes that these laboratories could become an even more significant resource in future attempts to provide greater occupational relevance to secondary education if they were to function in a more coordinated manner, and if they were to become sufficiently cognizant of and enthusiastic about present modernizing trends in the production of curricular materials. The first two objectives stated above represent an attempt to accomplish both coordination and stimulation among these centers.

Projected plans call for visitations to as many of the curriculum centers as time and funds will allow to enable SCOPE personnel to meet the directors, obtain a "feeling" for their facilities and operations, and to understand their problems and their ideas concerning a cooperative effort on their part toward a more relevant high school curriculum. These visitations will be followed by two conferences at Rutgers University in March and May of 1969. At this time the lab directors will have an opportunity to become personally acquainted, discuss the possibility of a communication network among the labs, and converse with other specialists about the latest advances in curricular theory and educational technology.

Proceeding simultaneously with the above mentioned efforts, the SCOPE staff will be examining, testing, refining, and promulgating what is known as the process-object model for an integrated curriculum. Briefly stated, this is a process by which ultimate curriculum objectives, stated in behavioral terms, are sequentially analyzed to identify and specify each of the comptencies which the student must acquire if the terminal objectives are to be achieved. Synonomous with "structural analysis," this approach leads to the identification of not only the competencies themselves, but the arrangement or sequence in which the competencies must be arranged to make progression possible. Once such a hierarchy of competencies has been developed for an instructional unit, the curriculum director can then use it as a map to guide him in the preparation of materials. If the hierarchy truly recreates the internal logic of the subject matter, instructional materials based on it can be expected to maximize learning.

SCOPE personnel hold great hopes for the process-object approach to curriculum planning. We believe that such a system will benefit not only vocational education in states such as New Jersey, but all of the disciplines in every state across the nation. By striving for behavioral objectives such as perception, conceptualization, application, evaluation and manipulation, rather than subject matter per se, the high school curriculum can transcend individual disciplines and lead to a truly integrated curriculum, one in which English, math, the social sciences, science, etc., can be taught in the shop rather than in separate classrooms. By utilizing this approach, perhaps we can begin to realize a truly "comprehensive" high school.

From Occupational Research and Development Branch of the New Jersey State Department of Education, Feedback, Winter edition, 1968.

are always looked upon as being valuable opportunities for publicizing SCOPE.

V. CAPITAL EQUIPMENT ACQUISITIONS

None

VI. FORMS

None

VII. OTHER ACTIVITIES

In an effort to increase our understanding of what constitutes a meaningful secondary school curriculum, we turned to materials published by the Ford Foundation. What follows below are abstracts written by Mr. Casello for two monographs produced by Mr. Marvin Feldman, Project Director at the Ford Foundation: Making Education Relevant, and Public Education and Manpower Development.

MAKING EDUCATION RELEVANT

In a blunt and uncompromising manner, Mr. Feldman lays a major share of the blame for the numerous social and economic ills facing this country today squarely at the feet of American educators, who, he claims, have failed to prepare people for the world of work. His thesis is that the great tragedy in American education today is the failure of educators from all disciplines to utilize the "hands-on" and learning by doing approaches to learning, resulting in the production of students who possess much irrelevant theory and few practical skills.

The appeal of this paper lies in its presentation of guidelines for a new direction in educational thinking. Mr. Feldman's message is a clarion call, hopefully sounding a renaissance in educational practices. The genesis of the change must originate in the mind, specifically with the acceptance of the notion that the difference between the graduate and the drop-out may not be a native ability to learn, but merely the ability to verbalize. Educators must reject the idea that non-academic students are generally of inferior academic quality, and substitute in its place as an educational objective that all students are to be considered potential candidates for post-secondary education and training. The alarming and almost fatal dichotomy that now exists between vocational education and the general or college preparatory curriculums must be ended, primarily by incorporating the world of work into the entire educational process. A much more meaningful educational structure would enable non-academic students to receive the training necessary for college entrance, while at the same time providing college-bound people with the opportunity to receive a vocational experience which would relate their learning to reality.

A more meaningful synthesis between the classroom and the world of reality outside its four walls entails a major upheaval in the educational structure. Out-moded training facilities must be brought in line with on-the-job working conditions. Training content itself needs review and revision so as to meet the needs of the job market. Vocational guidance must be provided for students, both quantitatively and qualitatively. At the base of the new edifice, however, is a curriculum which has been coordinated from the elementary through the secondary grades, one in which vocational and academic education embrace and reinforce each other, where a youngster is assisted in discovering, defining, refining, and using his talents in working toward a chosen career. To accomplish this, Mr. Feldman suggests an individualized program in which each student would be introduced early to the concept of choice between achievement through verbal or abstract performance, and achievement through manipulation and demonstration with objects. Commensurate with this approach would be an emphasis on familiarizing the student with the world of work and helping him to appreciate man's various talents and their relationship to the world of work.

The continuum at the junior and senior high levels would reinforce earlier training, as vocational and academic teachers combined in a team-teaching approach to the coordinated curriculum. Every male would take a general industrial arts course in which they would be introduced to the basic manipulative skills. Vocational guidance would complement what counseling proceeded and would acquaint students with the workings of industry, match individual talents to career objectives as determined by a battery of continuous testing, and complete an annual career-objectives analysis which would enable the student to comprehend the relevance of his school program.

For the growing numbers of students who would be seeking post-secondary education because of this more meaningful curriculum, community and four-year colleges would include technical education in their programs which would concentrate on the teaching of specific skills. To do so would necessitate close articulation between college and high school, but this is critical if today's education is to be the rigorous, respectful, and relevant experience that Mr. Feldman suggests it can.

PUBLIC EDUCATION AND MANPOWER DEVELOPMENT

The major thesis of this paper, an adaptation from a talk given by Mr. Feldman at Columbia University in June of 1967, is that the public schools must be assigned and willingly accept the responsibility for career preparation. This is a vital undertaking, for it will enable members of minority groups to take advantage of economic opportunity at the time it is received, and will help to avoid duplication of efforts among programs to aid the disadvantaged that exist both within and without the sphere of the formal educational system.

Career preparation on the part of our school system will not be an easy task, largely because of the secondary role that vocational education plays in the overall educational structure, and because general educators neither understand the process of vocational education nor recognize their total responsibility in helping individuals progress toward vocational competence. This is indeed tragic, for many who could be saved by vocational education are either lost because of the irrelevancy of their early schooling, or an inadequately prepared to receive further training.

Mr. Feldman is quick to hold out hope for constructive change, as he views the problem to be mainly one of understanding the purpose of vocational education rather than resistance to change itself. He suggests that educators begin by accepting the notion that all children have a native ability to learn and by recognizing that there are alternative routes to achievement other than verbal and abstract, such as doing, making, creating, and performing. This will necessitate, of course, a diagnosis of individual learning styles and an implementation of individualized learning programs, but both are long overdue innovations in the public schools.

As a second measure, all learning should be made relevant to the outside world. This can be accomplished through what the author defines as an "occupational-conscious curriculum," one in which there is an explicit bond between school activities and preparation for an eventual career. Education, claims Mr. Feldman, can no longer ignore the world of work, or provide occupational preparation for only those who cannot achieve success in the college-preparatory or general curriculums.

Mr. Feldman concludes by clearly mandating priorities for action. The first is to clarify the role of all the components of education, whether they be within the school or in the world outside. The roles of city, state, and national governments, economic opportunity programs, Labor Department manpower programs, and the formal educational system must be clearly delineated. It is Mr. Feldman's belief that all pre-employment and pre-college programs should be the responsibilities of public education, leaving cooperative education programs to provide a vehicle for advancement after employment, and the Department of Labor to oversee registered programs for trade union opportunities.

In conjunction with role defining would be the development of so-called supplementary centers. Such centers would provide an environment in which students and teachers from feeder schools would come together to enrich their own educational development and to work toward the improvement of school curriculum content. In addition, such centers could contribute greatly to the eradication of the barriers that presently exist between blacks and whites.

Finally, Mr. Feldman proposes the inclusion of a continual analysis of each student's skills, interests, and learning style. Guidance personnel would become as proficient in their knowledge of job needs and occupational skills as they are in colleges and entrance procedures. The individual would be aware at all times of his skills, aptitudes, and interests so that he could wisely choose his eventual profession.

VIII. STAFF SUMMARY

		Federal	Local	
Bruce W. Tuckman	Director	$1,926	$566	10/1-12/30 3/4 time
Joseph H. Casello	Assist. Dir.	2,924		10/1-12/30 full time
Ricardo Grippaldi	Res. Assist.	275		10/1-12/30 1/2 time
Carol Porter	Res. Assist.	275		10/1-12/30 1/2 time

IX. FUTURE ACTIVITIES PLANNED FOR NEXT REPORTING PERIOD

The third quarter of SCOPE's first year of life should prove to be as hectic, if not more so, than the two previous quarters. Depending upon existing travel funds, plans are being made to visit the trade and industrial curriculum laboratory in Columbus, Ohio, and possibly those in Nachitoches, Louisiana, and Urbana, Illinois. We feel that our visits to curriculum labs have been most valuable, and we would like to visit as many of them as possible.

A request has been made to the Ford Foundation for funds with which to visit various innovative educational programs which they sponsored. If the request is granted, Dr. Tuckman, Dr. Carl J. Schaefer, chief consultant to the SCOPE Project, and Mr. Casello will visit:

1. The Nova School in Fort Lauderdale, Florida, to observe the many innovations practiced there
2. Central Michigan University in Mount Pleasant,

Michigan, to observe the coordinated curriculum approach to vocational education, and

3. Cogswell Polytechnical College and the City College of San Francisco, California, to observe the "Richmond Plan" and programs in hotel and restaurant management.

Work must also be started on preparations for the two spring conferences at Rutgers University. Letters of invitation to the program will be sent to those speakers and consultants chosen by the SCOPE staff to participate in the program. Communication will continue with the lab directors in an effort to formalize the format to be used for the first meeting. Plans will be made for bringing the directors to Rutgers at SCOPE's expense.

The SCOPE staff will begin a scrutiny of the budget to determine next year's needs, especially with regard to additional staff members. There is every indication that in addition to the present staff, we will need another part-time graduate assistant, and probably a full-time staff member who would work closely with Dr. Tuckman in analyzing and in coordinating the enormous amount of research data that the staff will begin to compile.

X. CERTIFICATION

Bruce W. Tuckman

Signature of Contract Officer

Signature of Principal Investigator or Project Director

Jan. 21, 1969

Date

Date

APPENDIX 1

Questions on Tracking

I. Characteristics of the tracks in the high school.

1. How many tracks are there? How do these vary by subject matter?
2. What curriculums (courses) are covered in the different tracks? In what way are these similar and different in subject matter? In skill level?
3. What is the average class size of classes in the different tracks?
4. What criteria are used for initial assignment of students to different tracks in the various subject matters?
    a. What are the criteria indices (i.e., measures or judgments)?
    b. What are the cutoff scores on these indices?
    c. How are these indices combined or weighted in making a tracking decision?
    d. How were these criteria determined (what basis)?

II. Characteristics of the students in the different high school tracks.

5. What is the racial composition of the different tracks?
6. What is the dropout rate in the different tracks?
7. What percentage of students move from each of the tracks to higher tracks during high school? What percentage move to lower tracks?
8. What is the probability that a student will be in the same track across all subject matters?
9. What is the average score for students in each of the tracks on standardized measures of achievement, intelligence, and reading level at different grade levels?
10. What relative gains or losses do students in each of the tracks show in achievement, intelligence, and reading level measured from high school entry to graduation?
11. Are the performances of students in the different tracks more similar in the freshman or the senior years?

12. Is final student ranking in the graduating class influenced by track?
13. What do the graduates of the different tracks do upon graduation?
14. What are subjective impressions of self (self-worth, growth) among students in each of the tracks?
15. What are the attitudes of students in the different tracks toward the education they are receiving?

III. The high school teacher and tracking.

16. What performance expectations do teachers have for students in the different tracks?
17. What kind of supervision do teachers receive relative to their dealing with the different tracks?
18. Are the teachers aware of what is being covered in their area in the different tracks and are they attempting to cover the same concepts at an appropriate level?

IV. The educational system.

19. Has tracking in your high school ever been evaluated?
20. Has heterogeneous grouping recently been tried in your high school? What were the outcomes?
21. How many innovations have been undertaken in your high school within the past five years? What were they?
22. How do your high school students compare to others on national norms? How does this comparison fare by racial groups?

Based on answers to the above questions, we will attempt to draw conclusions about the effects of tracking on student performance. We will attempt to determine whether the present system is an educational success for all students.